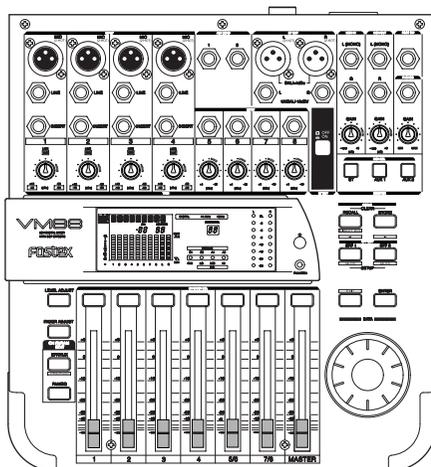


Model VM88

Eight Channel Digital Mixer with DSP Effects



Introduction

Thank you very much for purchasing the Fostex VM88.

Please read the following to get the most satisfaction from your purchase, and to learn important information about safety precautions when using Fostex products.

The VM88 digital mixer does all internal signal processing digitally.

The input features 8 analog channels, of which 4 channels (XLR or PHONE) are for microphones; digital inputs (S/P DIF or ADAT) via optical connection are provided. For outputs, an optical digital output (S/P DIF or ADAT) in addition to stereo out (balanced/unbalanced), headphone out, AUX send/out and monitor outs in analog are also provided. An insert function is featured in channels 1 - 4 for more flexibility during mixing.

In addition to each input channel, an three band EQ is also provided for the master output. The VM88 also incorporates high performance DSP multi-effects on two channels that operate by A.S.P. (Fostex Advanced Signal Processing Technology*) exclusively developed by Fostex. This allows a wide range of equalizing and effects processing. All settings, including mix and effects settings, are stored in scene memory, and a desired scene memory can be recalled instantaneously. Although small and lightweight, the VM88 is a high performance unit. Please read this manual carefully before operation to understand all functions of the VM88.

* See page 24 for more details on the A.S.P. (Fostex Advanced Signal Processing Technology).



CAUTION

RISK OF ELECTRIC SHOCK
DO NOT OPEN



CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK,
DO NOT REMOVE COVER (OR BACK).
NO USER - SERVICEABLE PARTS INSIDE.
REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.

"WARNING"

"TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE."

SAFETY INSTRUCTIONS

1. Read Instructions - All the safety and operating instructions should be read before the appliance is operated.
2. Retain Instructions - The safety and operating instructions should be retained for future reference.
3. Heed Warnings - All warnings on the appliance and in the operating instructions should be adhered to.
4. Follow Instructions - All operating and use instructions should be followed.
5. Water and Moisture - The appliance should not be used near water - for example, near a bathtub, washbowl, kitchen sink, laundry tub, in a wet basement, or near a swimming pool, and the like.
6. Carts and Stands - The appliance should be used only with a cart or stand that is recommended by the manufacturer.



An appliance and cart combination should be moved with care. Quick stops, excessive force, and uneven surfaces may cause the appliance and cart combination to overturn.

7. Wall or Ceiling Mounting - The appliance should be mounted to a wall or ceiling only as recommended by the manufacturer.
8. Ventilation - The appliance should be situated so that its location or position does not interfere with its proper ventilation. For example, the appliance should not be situated on a bed, sofa, rug, or similar surface that may block the ventilation openings; or, placed in a built-in installation, such as a bookcase or cabinet that may impede the flow of air through the ventilation openings.
9. Heat - The appliance should be situated away from heat sources such as radiators, heat registers, stoves, or other appliances (including amplifiers) that produce heat.
10. Power Sources - The appliance should be connected to a power supply only of the type described in the operating instructions or as marked on the appliance.
11. Grounding or Polarization - The precautions that should be taken so that the grounding or polarization means of an appliance is not defeated.

CAUTION:

TO PREVENT ELECTRIC SHOCK, MATCH WIDE BLADE OF PLUG TO WIDE SLOT, FULLY INSERT.

ATTENTION:

POUR ÉVITER LES CHOCS ÉLECTRIQUES, INTRODUIRE LA LAME LA PLUS LARGE DE LA FICHE DANS LA BORNE CORRESPONDANTE DE LA PRISE ET POUSSER JUSQU' AU FOND.



The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

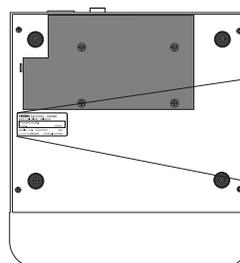


The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

12. Power Cord Protection - Power supply cords should be routed so that they are not likely to be walked on or pinched by items placed upon or against them, paying particular attention to cords at plugs, convenience receptacles, and the point where they exit from the appliance.
13. Cleaning - The appliance should be cleaned only as recommended by the manufacturer.
14. Nonuse Periods - The power cord of the appliance should be unplugged from the outlet when left unused for a long period of time.
15. Object and Liquid Entry - Care should be taken so that objects do not fall and liquids are not spilled into the enclosure through openings.
16. Damage Requiring Service - The appliance should be serviced by qualified service personnel when:
 - A. The power supply cord or the plug has been damaged; or
 - B. Objects have fallen, or liquid has been spilled into the appliance; or
 - C. The appliance has been exposed to rain; or
 - D. The appliance does not appear to operate normally or exhibits a marked change in performance; or
 - E. The appliance has been dropped, or the enclosure damaged.
17. Servicing - The user should not attempt to service the appliance beyond that described in the operating instructions. All other servicing should be referred to qualified service personnel.

< IMPORTANT! >

Equipment name, electrical ratings, serial number and other information for the VM88, are written on bottom side.



FOSTEX MODEL VM88
8CH DIGITAL MIXER
FOSTEX CORP. *** Hz
SERIAL NO. ***** BN
フォステクス株式会社 MADE IN JAPAN

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Precautions (please read before use)

Power Supply

- * When unplugging the power cable the outlet, be sure to grasp the adaptor. Attempting to unplug it by pulling on the AC cable may damage the wiring.
- * It is dangerous to use any power cable that is cut or frayed. If the power cable is damaged, immediately stop using it, and have it repaired.
- * Do not plug in or unplug the power cable with wet hands. Doing so may result in dangerous electric shock.
- * Do not open the unit or touch any parts inside. Doing so may result in a dangerous electric shock, and could damage the unit.
- * Do not let water or other liquids, flammable materials, or metal objects such as pins get in side the unit. These things may cause electric shock or short circuit the VM88, and damage it. If the VM88 should become wet, unplug the power cable from the AC outlet, and contact your authorized service station.

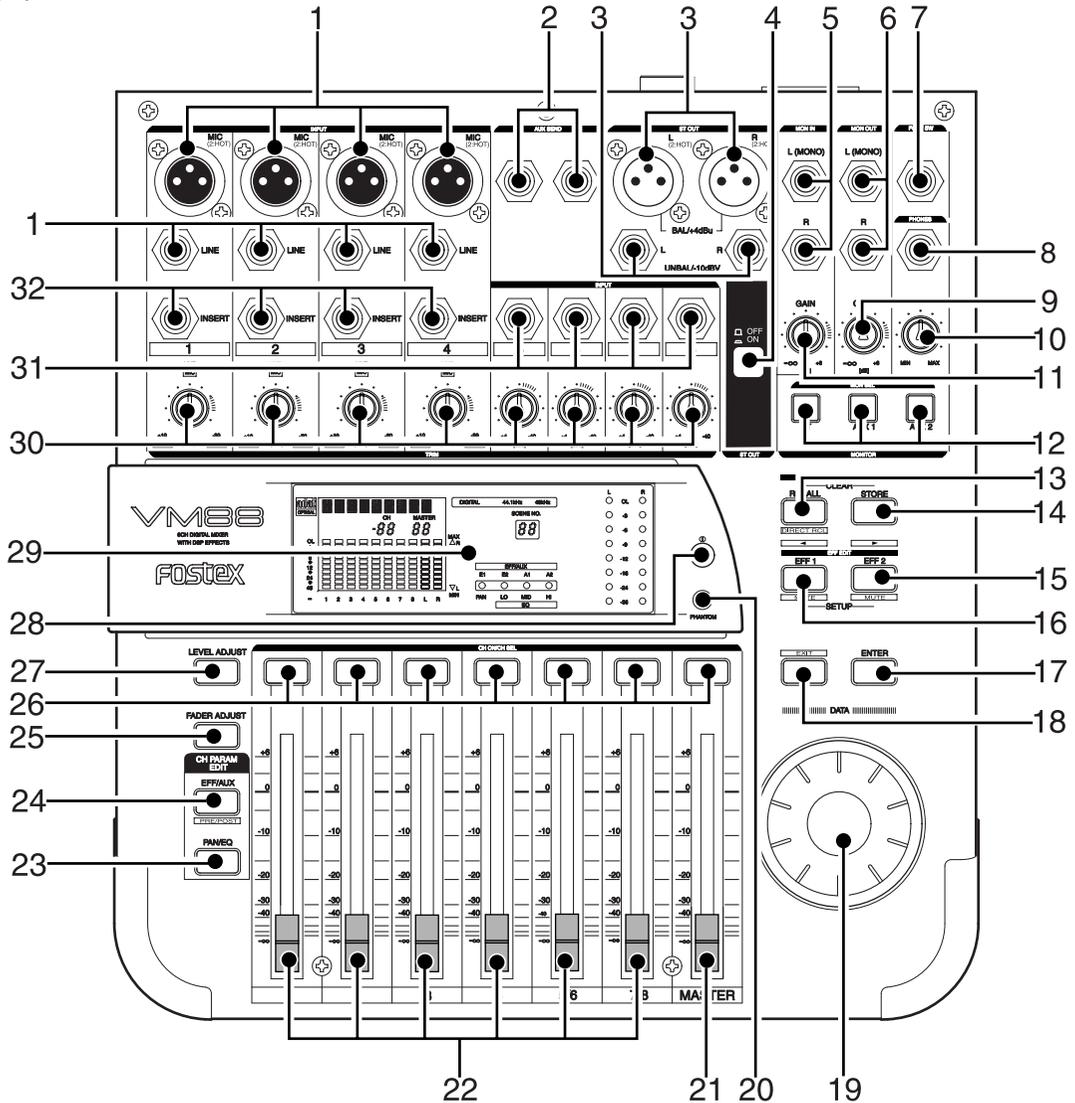
Location

Avoid using the VM88 in the following locations:

- * Locations of extreme low or high temperatures, or extreme changes in temperature.
- * Locations with excessive moisture or dust.
- * Locations where direct sunlight falls for an extended time, or near a stove or other source of heat.
- * Locations where electrical voltage varies.
- * Unstable locations or where there is heavy vibration.
- * Near strong magnetic fields (on top of a television or speaker).

Names and Functions

Top panel section



1. Input connector

External sound sources are input here. MIC 1 ~ 4 are for Canon connectors (XLR-3-31; pin 2=hot), which comply to mic/line signals. The input gain can be trimmed within a range of -50dBu ~ -10dBu. Because phantom power is available at these connectors, condenser mics can also be connected. LINE 1 ~ 4 are TRS phone jacks exclusively for line inputs and each input gain can be trimmed the same as with MIC 1 ~ 4, within a range of -30dBu ~ +10dBu. For details, please refer to “Connecting peripheral equipment” on page 9.

2. AUX send jack

AUX SEND level signal adjusted in the channel parameter edit mode is output here. For details on adjusting the output signals, refer to “Channel parameter edit mode” on page 20.

3. Stereo out connector

The mixed signal to be input to an MTR or other mixer is output from this connector. Connectors for balanced output (XLR-3-32 type) and unbalanced output (phone) are provided and the output level can be adjusted by the MASTER fader. The output signal can be switched on/off by the ST OUT ON/OFF switch.

4. Stereo out ON/OFF switch

Stereo out signal ON/OFF is controlled by this switch. For details, please refer to "Normal mix mode" on page 15.

5. Monitor in jack

External signals are input here.

The input signal is adjusted via the MON IN GAIN knob and directly mixed into the monitor circuit, so that it can be monitored at the PHONES and MON OUT L, R jacks together with a monitor signal selected by the MON SEL switch.

6. Monitor out jack

Powered monitoring speakers or an amplifier + speaker combination are plugged in here. The signal to be monitored is selected by the MON SEL switch and the output is adjusted with the MON OUT GAIN knob. For details, please refer to "Connecting peripheral equipment" on page 9.

7. Foot switch connecting jack

A foot switch (Fostex Model 8051) is plugged in here. The foot switch function can be changed by the [SETUP mode] explained later. The initial setting recalls the scene memory. Refer to page 33 for details.

8. Headphone jack

The monitoring headphone is connected here. Use the PHONES GAIN control to adjust the sound level.

9. Monitor output adjusting knob

This controls the sound volume at the MON OUT L, R jacks.

10. Headphone volume

This adjusts the monitor headphone sound volume.

11. Monitor input adjusting knob

Use this to adjust the input signal level from the MON IN jack.

12. Monitor select switch

This is for selecting the monitor signal to be output at the MON OUT L, R and PHONES jacks. Either one signal in the stereo buss, AUX 1 buss or AUX 2 buss can be selected.

13. Scene Recall key

This is pressed to recall the scene memory explained later. Refer to [Recall of the scene memory] on page 30 for details.

14. Scene Store key

This is pressed to store a scene memory. Refer to [Storing the scene memory] on page 30 for details.

15. Effect 2 key

This is pressed to select the EFF 2 effects type or the parameter to be edited. Also, if this key is pressed while pressing the EXIT key, muting of EFF 2 can be

switched ON/OFF. Refer to [Effect edit mode] on page 24 for details.

16. Effect 1 key

This is pressed to select the EFF 1 effects type or the parameter to be edited. Also, if this key is pressed while pressing the EXIT key, muting of EFF 1 can be switched ON/OFF. Refer to [Effect edit mode] on page 24 for details.

17. Enter key

This is used to accept the current mode setting. This key will setup scene memory mode (page 30), the setup mode (page 33) and also the setup of effects type (page 26). Please refer to their respective explanation for details.

18. Exit key

This is used to exit from all modes but the normal mix mode. This key works for the channel parameter edit mode (page 20), the effects edit mode (page 24), the scene memory mode (page 30) and the setup mode (page 33). Refer to their respective explanations for details.

19. Data encoder

This dial is rotated to make settings such as setup of PAN and EQ. This dial works in the channel parameter edit mode (page 20), the scene memory mode (page 30) and the effects edit mode (page 24). Refer to their respective explanations for details.

20. Phantom LED

When the phantom power supply ON/OFF setting in the setup mode is set to ON, the LED will light but and extinguish when set to OFF. The phantom power supply is OFF from the factory. For details on ON/OFF of phantom power supply, refer to "Setup mode" on page 33.

21. Master fader

This adjusts the master level of signal output from the STEREO OUT L, R jacks and DIGITAL OUTPUT connector.

22. Input fader

Signal levels of sound sources connected to each INPUT jack can be adjusted with these fader. Input faders 5/6 and 7/8 controls both channels at the same time.

23. PAN/EQ select key

The channel parameter edit mode is entered when this key is pressed to setup of PAN and EQ. Refer to [Channel parameter edit mode] on page 20 for details.

24. EFF/AUX select key

The channel parameter edit mode is entered by pressing so the EFFECT send output and AUX send output can be adjusted. If this key is pressed while pressing the EXIT key, PRE/POST of EFFECT send/AUX send

can be setup. Refer to [Channel parameter edit mode] on page 20 for details.

25. Fader adjust key

This key warns by blinking if a fader position drifts or sound volume is accidentally changed at switch ON of power or at recall of the scene memory.

Use this key to enter the fader adjust mode to manually adjust the fader position. Refer to [Fader adjust mode] on page 31 for details.

26. Channel On/Channel Select key

The channel to be edited can be selected while in the channel parameter edit mode. In other modes, channel ON/OFF is possible. Refer to [Normal mix mode] on page 18 and [Channel parameter edit mode] on page 20 for details.

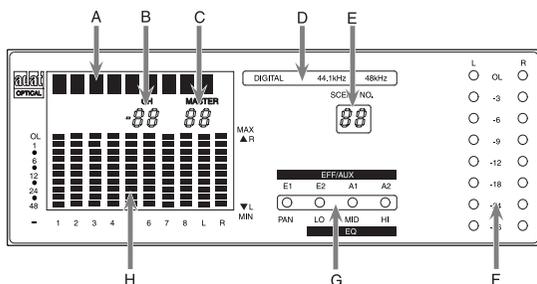
27. Level adjust key

This key will blink together with of the FADER ADJUST key. The level adjust mode is entered when this key is pressed so the sound level can be matched to the present fader position. Refer to [Level adjust mode] on page 31 for details.

28. Contrast adjusting knob

Adjust the LCD display contrast with this knob. Rotating this knob clockwise increases the contrast.

29. Display/status/meter section



(A) Character display section

Names of the scene memory or various edit modes are displayed.

(B) CHANNEL fader display section

In channel parameter edit mode, the INPUT fader position of the selected channel is displayed in units of 00 ~ 99. Nothing will be displayed in the initial state and the normal mix mode.

(C) MASTER fader display section

The MASTER fader position is displayed in units 00 ~ 99.

(D) Digital in status display section

This displays the [DIGITAL IN] setting in the setup mode, and the external digital input signal status. For details, refer to [IN/OUT of digital signals] in "Normal mix mode" on page 18.

(E) Scene number display

The current scene number is displayed here. Refer to [Scene memory mode] on page 30 for details.

(F) LED level meter display section

The output level of the STEREO BUSS is displayed here. When ST OUT ON/OFF is switched to OFF (■), all LEDs will blink to indicate that no signal is output from the ST OUT L, R connectors.

This level meter has a peak hold function, which is adjustable in the setup mode. The initial state peak hold time is set to 1.0 sec. For details, refer to "Setup mode" on page 33.

(G) Status indicator

Using the channel parameter edit mode explained later, what is currently setup can be confirmed by the dot display. Items to be set can be selected with the PAN/EQ key or the EFF/AUX key. Refer to [Channel parameter edit mode] on page 20 for details.

(H) LCD level meter

In normal mix mode, this indicates channels 1 ~ 8 input levels and the stereo buss level. In the various edit modes, the setup status will be displayed. The peak hold function is not provided in the LCD level meter.

30. TRIM knob

These knobs are for adjusting the input gain to match the sound source connected to INPUT 1 ~ 8. These can be adjusted within the range of -50dBu ~ -10dBu for MIC INPUT 1 ~ 4, -30dBu ~ +10dBu for LINE INPUT 1 ~ 4 and -40dBu ~ +4dBu for INPUT 5 ~ 8.

31. Input jack 5 ~ 8

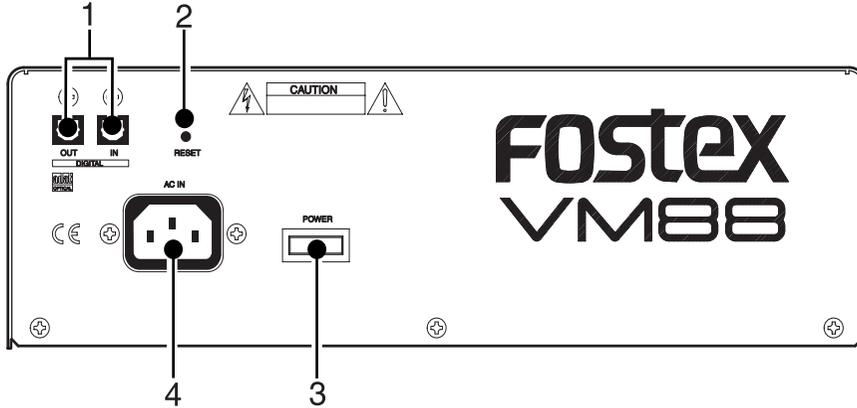
Line level sound sources can be connected to channels 5 ~ 8 input jacks (TRS phone jacks). In the initial setup, the input mode of INPUT 5-6 and INPUT 7-8 are set to stereo so that stereo output sound sources can be connected.

The input mode can also be set for monaural by the setup mode. Trim is adjustable to match the output of the sound source that is connected (Adjusting range: -40dBu ~ +4dBu). To setup of the input mode, refer to "Setup mode" on page 33.

32. Insert jack 1 ~ 4

These jacks are used when using a compressor/limiter on mic sound sources at inputs 1 ~ 4. For details, refer to "Connecting peripheral equipment" on page 9.

Rear panel section



1. Digital in/out jacks

Digital signals (S/P DIF or ADAT) from external digital equipment can be input to these DIGITAL IN jacks and then assigned to the desired input channel. S/P DIF or ADAT digital signals can be output from the DIGITAL OUT connectors. For details, please refer to "Connecting peripheral equipment" on page 9 and "In/out of digital signals" explained in "Normal mix mode" on page 18.

2. RESET switch

This switch resets the CPU inside VM88. Refer to page 8 for details.

3. POWER switch

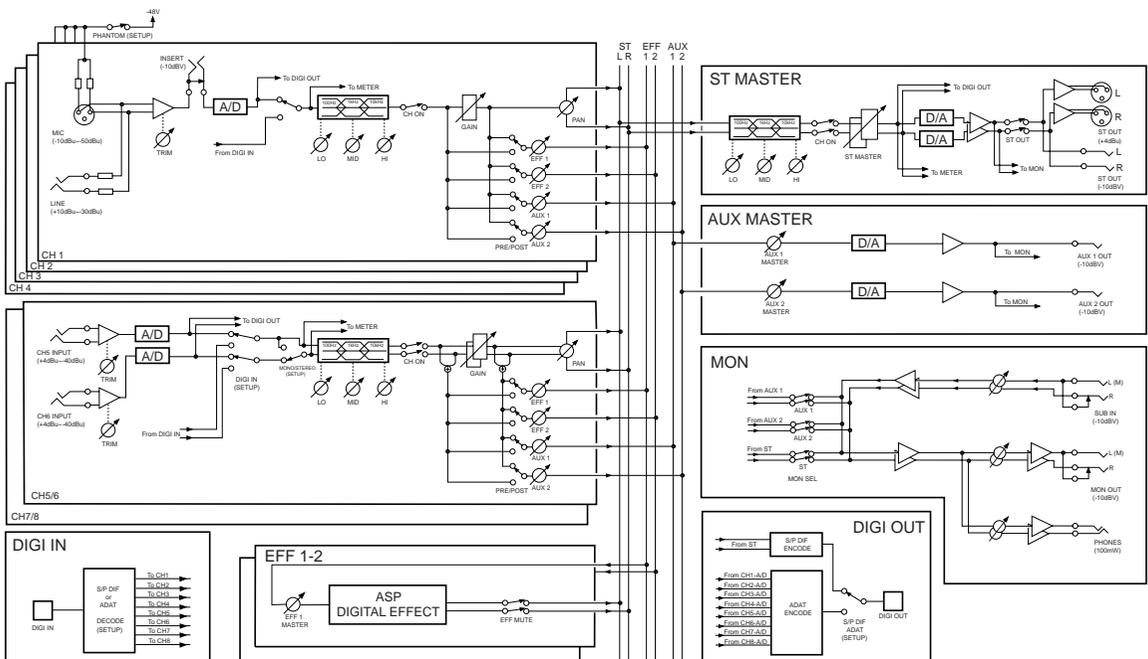
The On/Off power switch.

4. AC IN connector [AC IN]

Plug-in the power cable included with the VM88 here.

< NOTE >
If the VM88 is not to be used for long periods (more than one month) be sure to remove the power cable plug from the wall outlet.

Block Diagram

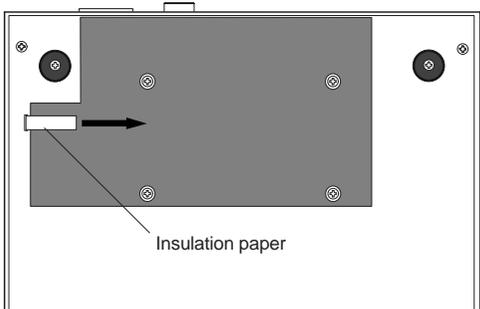


Before Operation (IMPORTANT Be sure to read below before first using your VM88.)

*** Remove the insulation paper**

The VM88 uses a memory back up battery inside. You will find a piece of insulation paper attached to avoid current dissipation.

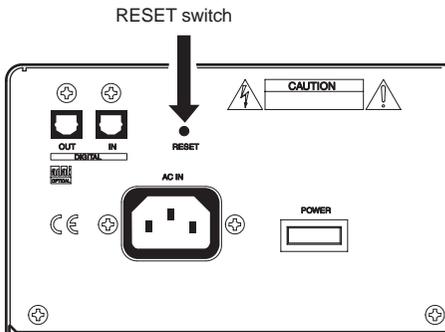
When using the VM88 for the first time, turn ON the power and then remove the insulation paper. The insulation paper is easily removed by pulling it in direction of arrow as shown at right.



*** Reset of VM88**

It is possible for the computer to malfunction at power ON/OFF or by electro induction noise from lightning. In this happens, switch the power ON/OFF to the VM88 several times.

If it does not return to normal operation, press the rear panel [RESET] switch with a slender ball point pen or similar tool. This returns all settings to the initial figures setup at shipping from the plant. This procedure can be used to clear all stored scene memories.

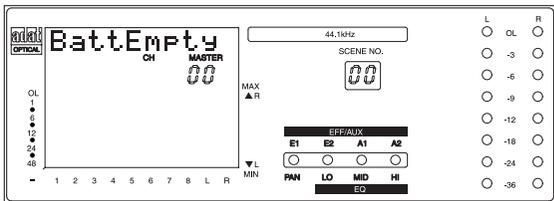


<Please remember!>
 If reset is executed with the INPUT and MASTER raised simultaneous with start up of this unit, the LEVEL ADJUST key/FADER ADJUST key will blink. This indicates that the VM88 has entered the Level Adjust Mode/Fader Adjust Mode because of the difference between present fader position and the fader position at start up following reset. To exit from this mode, retard all faders to the [MIN] position, and the key blinking will stop.

*** Internal battery for the memory back up**

The internal battery has a life expectancy of about two years. When the battery runs low and its voltage falls below a certain level, the warning message "BattEmpty" will appear in the display. If you continue to use the unit an old battery, your stored scene memories will be lost when the power is turned off.

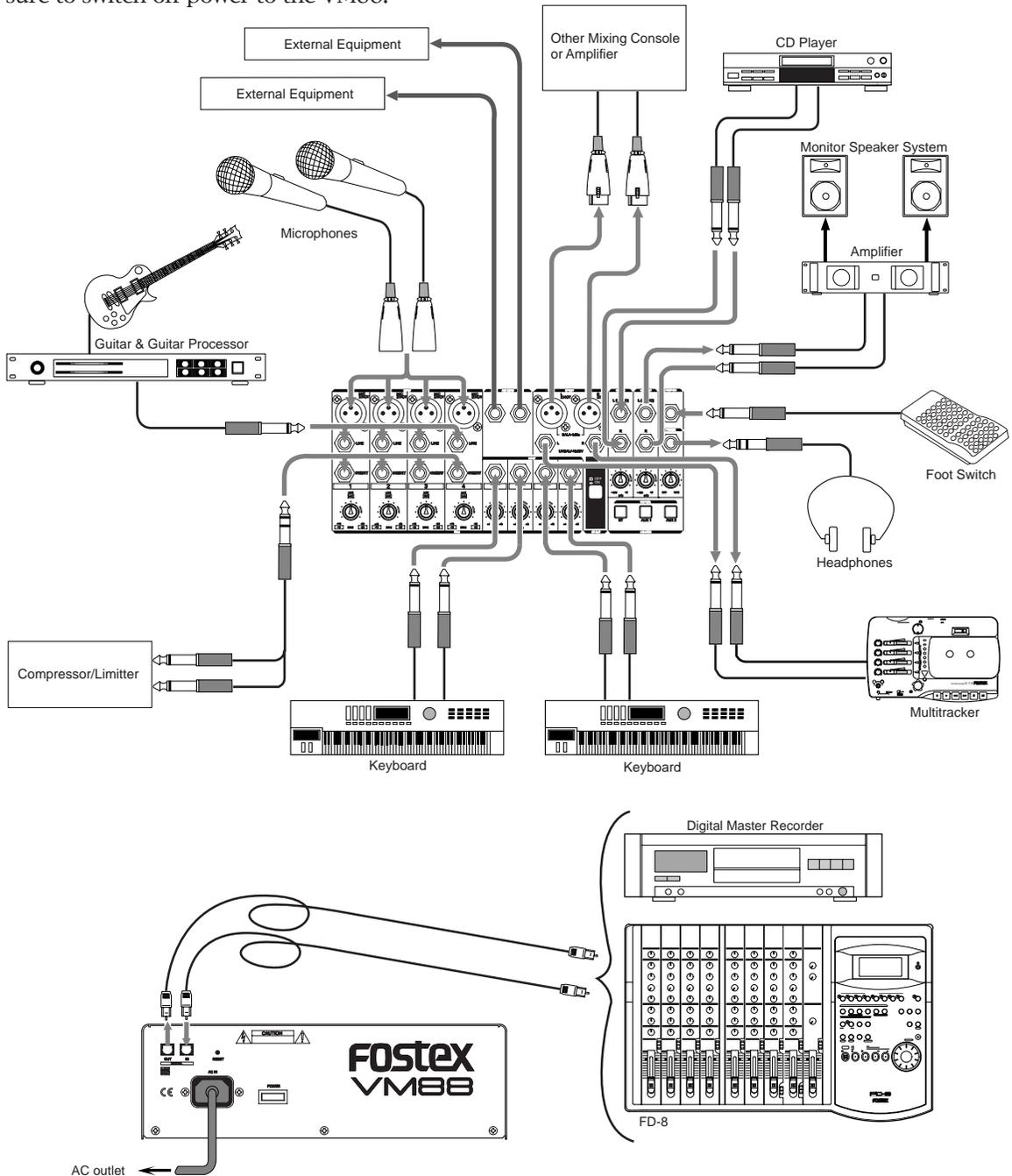
Do not try to replace the battery yourself as there are no user-serviceable parts inside. Please ask your Fostex distributor or an authorized service station to do the job.



<Please remember!>
 There is an automatic internal battery voltage check function in the VM88. Refer to [Set up mode] on page 33.

Peripheral Equipment Connection

Sound sources and external equipment shown in the examples below can be connected to the VM88's input and output connectors. When connecting external equipment to the in/out connectors, be sure to switch off power to the VM88.



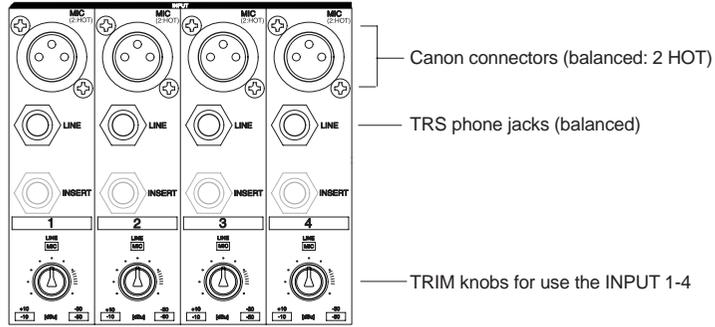
<Please remember!>
 If external digital equipment to be connected is provided with only COAXIAL (RCA pin jack) type IN/OUT connectors, use the optional Fostex COP-1/96k optical-coaxial converting adaptor sold separately.

(1) INPUT 1 ~ 4 connectors

Two types of connectors - Canon connectors (XLR-3-31 type) and TRS phone jacks - are provided for INPUT 1 ~ 4 and either can be used to input of signals depending on the application. Refer to < NOTES > below.

Canon connectors that comply to mic/line levels and microphones are connected here in most cases. Condenser type mics requiring phantom power can be connected because phantom power is provided to these connectors. Also, you can trim within a range of -50dBu ~ -10dBu to match the equipment connected.

Line level sound sources can be plugged into the TRS phone jacks, which complies to both TRS type and common phone plugs. The same as with the Canon connectors, trim is possible within a range of -30dBu ~ +10dBu to match the output level of the equipment connected.



< NOTES >

- * The Canon connector and TRS phone jack of each channel cannot be used in parallel. Use either input only. A malfunction could occur if both are used at the same time.
- * Be sure to switch off the power to the VM88 or switch off the phantom power when plugging or unplugging microphone cables.
- * Do not switch on the phantom power when using a dynamic mic. This could damage the microphone.

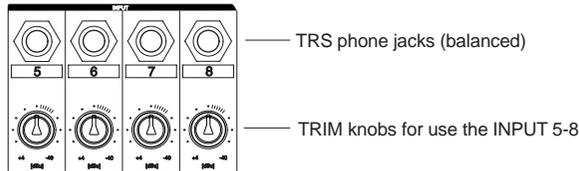
< NOTICE >

When using condenser microphones that require phantom power, first check “On/Off setting of phantom power” explained later in “Setup mode” (Initially set at off). For details, refer to “Setup mode” on page 33.

(2) INPUT 5 ~ 8 connectors

INPUT 5 ~ 8 are TRS phone jacks and line level sound sources can be plugged in here. The input mode (stereo or monaural) of the input connectors INPUT 5-6 and 7-8 can be changed depending on the application. Initially, the input mode of INPUT 5-6 and 7-8 are set to stereo.

The input jacks comply to both TRS type and common phone plugs, and just as with INPUT 1 ~ 4, the input level can be trimmed within a range of -40dBu ~ +4dBu to match the output level of the equipment connected.



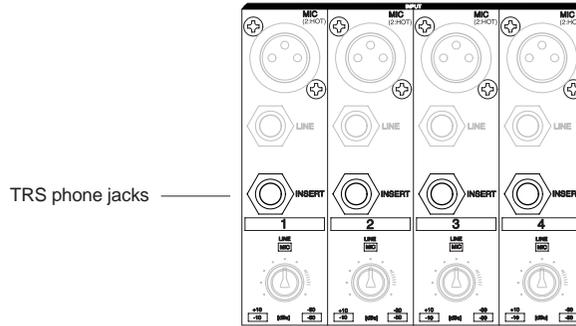
< Please remember! >

The input mode (stereo/mono) of INPUT 5-6 and 7-8 can be changed to match the application. Initially, they are set for stereo and thus stereo signals can be input to INPUT 5-6 and 7-8.

For example, if INPUT 5-6 are set to mono, the INPUT 5 jack will be effective and a signal input to INPUT 5 will be simultaneously sent to channels 5 and 6. For details on setup of the input mode, refer to “Setup mode” on page 33.

(3) INSERT 1 ~ 4 jacks

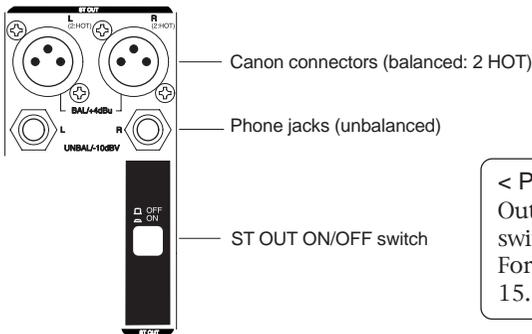
INSERT 1-4 jacks are used when a compressor/limiter is applied to the mic input signals into INPUT 1-4, as shown in the previous connecting example. The in/out are TRS phone jacks and standard input/output levels are -10dBV.



< Please remember! >
 When connecting a compressor/limiter to the INSERT jack, be sure to use the connecting cables shown below.

(4) ST OUT L, R connectors

Balanced output Canon connectors (XLR-3-32 type) and unbalanced output phone jacks are provided for ST OUT L, R, either of which can be selected depending on the application. Amplifiers and other mixers are connected here. The standard output level is balanced output +4dBu and unbalanced output -10dBV.



< Please remember! >
 Outputs from the ST OUT L, R connectors can be switched on/off with the ST OUT ON/OFF switch. For details, refer to “Normal mix mode” on page 15.

(5) DIGITAL IN/OUT jacks (Rear panel)

A digital signal (S/P DIF or ADAT) from external digital equipment is input to the DIGITAL IN jack; these signals can be applied to any input channel. From the DIGITAL OUT jack, mixed signal, which is the same as those output from the ST OUT L, R connectors can be output in digital (S/P DIF) or the INPUT 1-8 input signals can be directly output in digital (ADAT) signal. If ADAT is selected, the input signal prior to being affected by the INPUT fader and EQ can be output digitally.

< Please remember! >
 If a digital signal (S/P DIF or ADAT) is to be input to VM88 or a digital signal (S/P DIF or ADAT) is to be output from the VM88, it will be necessary to setup the system clock and DIGITAL IN or DIGITAL OUT modes. For details, refer to “Normal mix mode” on page 15 and “Setup mode” on page 33.

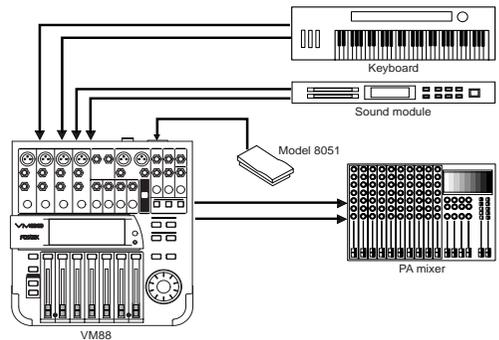
Application Examples

The following are actual examples in application of VM88 and could be helpful in your application.

< Example 1 > :

As a live performance keyboard mixer

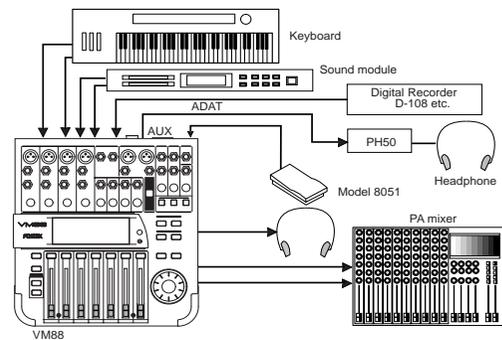
The VM88 can be used as a submixer for keyboards and sound source modules. Scene memory in which the sound balance has been set can be switched with a foot switch.



< Example 2 > :

As a live performance keyboard mixer with sync

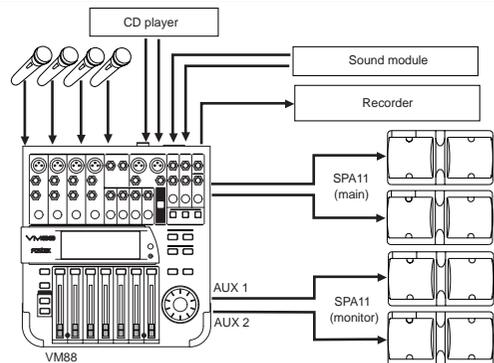
In addition to the keyboard and sound source module mix, playback of ADAT sound can be mixed simultaneously. By outputting a track containing a click from the AUX SEND jacks via the pre-fader, a cue can be sent to the monitor headphone and the drummer.



< Example 3 > :

As a small PA mixer

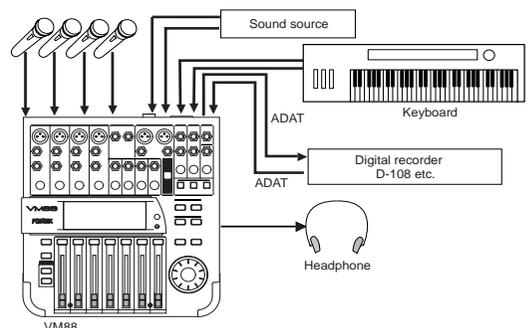
The VM88 can be used as a PA mixer with two channels of monitor sends. Balance can be pre-stored in the scene memory and sequentially called in accordance to the script.



< Example 4 > :

As a recording mixer (overdub) for an ADAT recorder

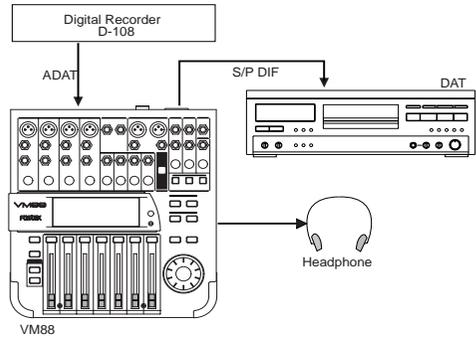
Overdubbing of ADAT or one-time recording of 8 tracks is possible by setting Digital In to [ADAT-All Ch] and Digital Out to [ADAT Dir]. Playback monitor level is adjusted via the fader and the recording level by the TRIM knob.



< Example 5 > :

As a recording mixer (mixdown) for an ADAT recorder

Sound sources (Ch 1 ~ Ch 8) recorded in the ADAT recorder can be mixed in the VM88 and digitally mixed down to external digital equipment such as DAT.

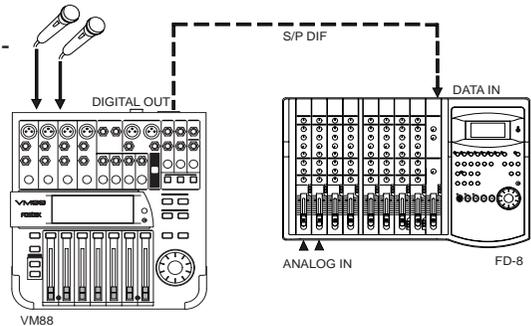


<Example-6>

To expand the FD-8 analog simultaneous recording channel

The FD-8 analog simultaneous recording track can be extended to "4" by connecting the FD-8 DATA IN connector to the VM88 DIGITAL OUT connector.

You can also take advantage of the high quality DSP multi-effects contained in the VM88 when recording.

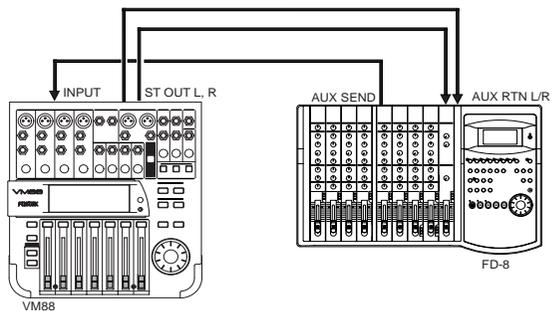


<Example-7>

To use as a MONO IN/STEREO OUT effects

The VM88 internal DSP multi-effects can be utilized for high quality external processing by connecting the VM88 ST OUT L, R to the FD-8 AUX RTN L, R jack.

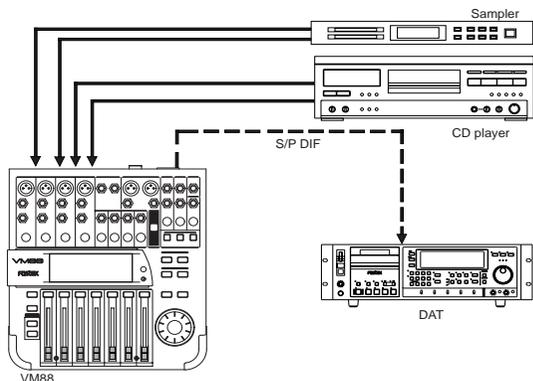
If the input channel fader is set "0" and the EFF BUSS is sent via the pre-fader, the effects sound only can be output from ST OUT.



<Example-8>

To produce original remix

You can send the remixed sound of the Sampler and CD player with the internal digital effect to a DAT recorder via the S/P DIF.



VM88 Initial State

The following explains what to do the first time you use the VM88 directly from the shipping carton. When the power cable is plugged into the wall outlet and the VM88 POWER is switched on, the VM88 display and the operating panel lamps will become active as shown below. This is the same as when the CPU is reset by pressing the RESET switch.

Character display section:
Following the <<FOSTEX>> -> <<VM88>> display, [Init.Mix] will be displayed. If the INPUT fader/MAS-TER fader is manipulated in this state, [] will be lit behind the [Init.Mix] display (Refer to next page).

MASTER fader section:
The MASTER fader position is indicated by numbers 00 ~ 99. The initial setting is [00] which is the initial mix setting (The fader [MIN] position).

DIGITAL IN status display section:
The DIGITAL IN status will be displayed and during initial setup [44.1kHz] will be lit. For details, refer to "Normal mix mode" on page 15.

Scene number display section:
The current active scene number (00 ~ 20) is displayed. In the initial setting, [00] will be displayed.

Channel fader display section:
After entering the channel parameter edit mode, the INPUT fader position of the channel selected by the CH ON/CH SEL key will be indicated by numbers 00 ~ 99. In the initial state, nothing is displayed. For details, refer to [Channel parameter edit mode] on page 20.

Level display section:
If in any mode except the channel parameter edit mode and the fader adjust mode, the signal level input to each INPUT connector for channels 1 ~ 8 will be indicated by the prefader. In other words, the input signal level will be constantly displayed regardless of the INPUT fader position. At TRIM knob to adjust the gain is provided to match the sound source input for each INPUT for channels 1 ~ 8. By watching the level display while adjusting the gain, the most suitable gain adjustment can be made. Channels L and R display the signal level which is output from the STEREO OUT L, R connectors but, in the initial state, the level meter will not show any value as the MASTER fader will be at [MIN]. For both inputs and outputs, if the signal level reaches [OL] (over load), the sound will distort and therefore, the TRIM and INPUT faders should be checked and adjusted if necessary.

CH ON/CH SEL key:
The channel to be edited can be selected with this key in the channel parameter edit mode and, in other modes, each channel can be switched ON/OFF. In the initial state, all channels will be indicated as ON and the key LED's will all light.

Status indicator:
The dot selected by the channel parameter edit mode will light but nothing lights in the initial state. Refer to [Channel parameter edit mode] on page 20 for details.

< Please remember! >

- * The scene number of the sber of the ssber of the scene memory which the user can setup are [01] ~ [20] but the preset scene [00] cannot be changed. Refer to page 30 for details on the scene memory.
- * If, for some reason, you would like to return the VM88 setting to the factory default figure, refer to [Reset of VM88] on page 8.

Normal Mix Mode

Normal mix mode means each INPUT fader/MASTER fader is active, and the ON/OFF of each channel is operational so basic mixing functions can be executed. When the VM88 is in [Initial state of VM88], as explained in the previous section, if the INPUT fader of the channel to which a signal is being input (Example: The channel 1 INPUT fader if a sound source is connected to INPUT 1.) and the MASTER fader is raised, signals will be output from the STEREO OUT L, R jacks and the DIGITAL OUT connector. Also, if headphones are connected to the PHONES jack, the same signal will be heard in the headphones. The headphone monitoring sound volume can be adjusted by the top panel PHONES GAIN knob. Throughout these operation, the VM88 LCD display will change as explained below.

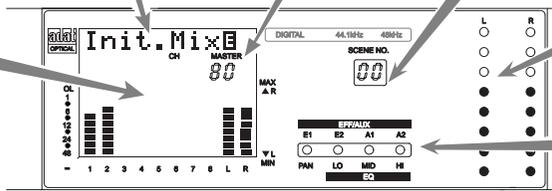
Character display section:

lights following the [Init.Mix] display. This symbol means "edit" and indicates that the setting had been changed from the initial state. At this point of operation, the initial state had been changed by this moving the INPUT and MASTER faders.

The MASTER fader display section:
The present position to which the MASTER fader is set will be indicated by numbers 00 ~ 99. The standard level setup number is [80].

Scene number display section:
The current scene number will be displayed.

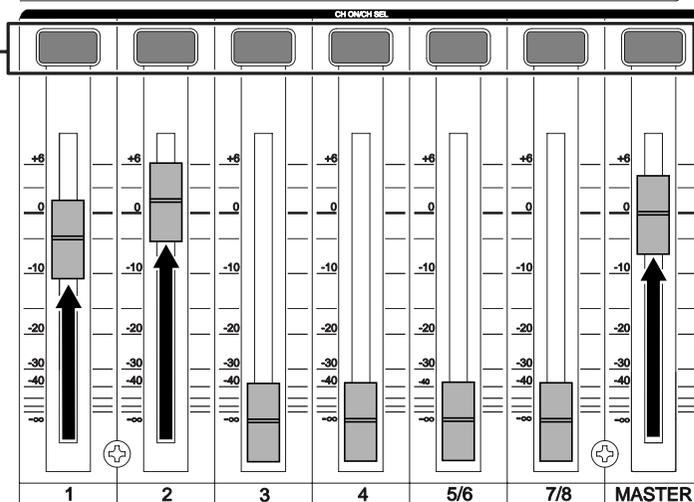
Level display section:
The input signal level will be displayed for channels 1 ~ 4, 5/6 and 7/8 and the output level in accordance to the MASTER fader position indicated by L and R.



Level meter:
Displays the STEREO BUSS L, R output levels.

Status display section:
Nothing will light up in the normal mix mode.

All channels are ON.



< Useful information !>

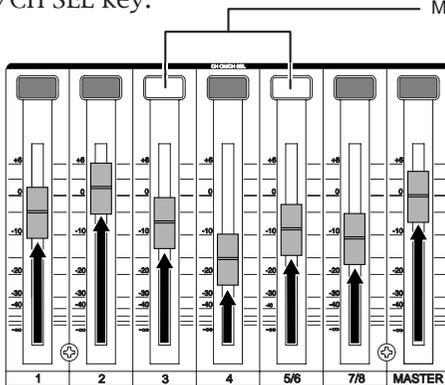
- * When the MASTER fader is rotated, its position will be digitally indicated in the MASTER fader section in the display and the sound volume will vary. A digital indication of the INPUT fader position will be displayed in the [Channel parameter edit mode] explained in the next section. For details, refer to [Channel parameter edit mode] on page 20.
- * The relationship between the actual gain and the INPUT fader and MASTER fader is, 00 = -∞, 80dB = 0dB, 99 = +6dB.

<CAUTION !>

If [Fader Fix mode], discussed below, in the [Setup mode] is set to [ON], no signal will be output even though the fader is moved. The [Fader Fix mode] is set to [OFF]. For details refer to [Setup mode] on page 33.

Mute of the various input channel/master output

Mute ON/OFF of channels 1 ~ 4, 5/6, 7/8 and master output can be done using the CH ON/CH SEL key. Normally, the CH ON/CH SEL keys for channels 1 ~ 4, 5/6, 7/8 and MASTER are all ON (key LED is lit). Therefore, when the CH ON/CH SEL key of the channel you wish to mute is pressed, sound from that channel only will be muted (the CH ON/CH SEL key LED of the channel that was pressed will be extinguished). Mute ON/OFF alternates with each pressing of the CH ON/CH SEL key.



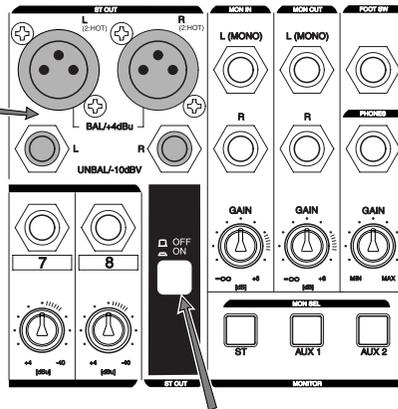
<Useful information !>

In addition to operating with the CH ON/CH SEL key, mute ON/OFF of master output is also possible using the foot switch (Optional Model 8051). In the foot switch functional setting is set for [Mute function of master output] in the [Setup mode] of the VM88, mute can be executed by stepping on the foot switch. For details on the [Setup mode], please refer to page 33.

On/off of the stereo out L, R signals

The stereo L, R output signals from ST OUT L, R connectors (balanced/unbalanced) can be set to on or off by the VM88 top panel ST OUT ON/OFF switch. This is ON (■) at leaving the plant.

Outputs from ST OUT L, R connectors (balanced/unbalanced) can be switched ON or OFF.



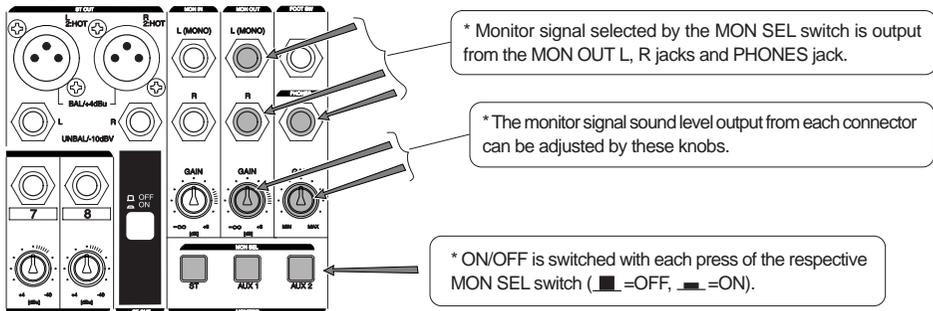
< NOTE >
When ST OUT is switched OFF (■), all of the LED level meters will blink. This is not a malfunction, but indicates that no signal is being output from the ST OUT L, R connectors.

* ST OUT ON/OFF switch (ON and OFF alternates with each press of this switch)

< Please remember! >
Switching on/off the output signal from the ST OUT L, R connectors is also possible by muting (see previous explanation) the master channel with the MASTER channel CH ON/CH SEL key. This procedure also mutes the monitor output and the S/P DIF digital signal (except the ADAT digital signal).
When manipulating the ST OUT ON/OFF switch, the ST OUT L, R connector output signal only is controlled; the monitor output/DIGITAL OUT signal (S/P DIF or ADAT) will not be affected.

Selecting the monitor signal

For monitor signals from MON OUT L, R and PHONES jack, any one of the stereo buss L, R signal, AUX buss 1 signal or AUX buss 2 signal can be output and selected by the MON SEL switch depending on the application as shown in the schematic below.



< Caution at monitoring with headphones! >

Because the PHONES output is designed for high sensitivity, there is ample gain available through the PHONE GAIN knob even when it is only raised a small amount. Therefore, when monitoring the various buss signals or input signals from external equipment connected to the MON IN connector, gradually raise the PHONES GAIN knob from its MIN position so as not to raise the gain to an unnecessarily high level. Otherwise, a loud noise could injure your ears.

< Please remember! >

Regardless to the MON SEL switch setting, the input signal from MON IN L, R can be monitored by adjusting the GAIN knob of MON IN.

<Useful information !>

In the normal mix mode, if the position of the INPUT fader/MASTER fader before switching off power is different from when power is switched on (refer to schematic below), the FADER ADJUST and LEVEL ADJUST key LED's (red) will flash. This is because the fader setting before switching off power is in memory, and the VM88 is indicating that fader and level adjustment is possible.

The fader position can be reset to the position prior to switching off power, and the level position can be deliberately set to the present sound volume setting.

* To return to the setting before switching off power:

Press the flashing FADER ADJUST key (It will enter the fader adjust mode). Subsequently, adjust each fader position by referring to [Fader adjust mode] explanation.

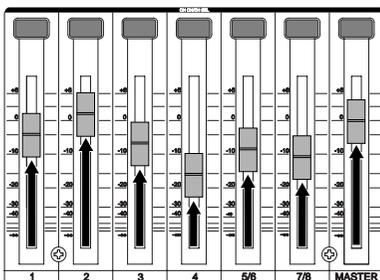
* To set to the present fader position:

Press the flashing LEVEL ADJUST key and the VM88 will enter the level adjust mode.

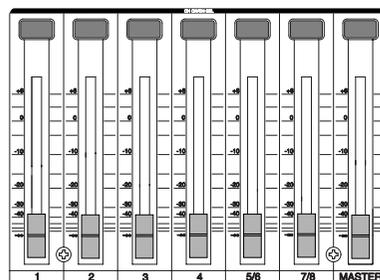
Then setup by following [Level adjust mode] on page 31.

If it is not necessary to match the fader positions, the FADER ADJUST key flashing will extinguished after all faders are moved and the VM88 will return to the normal mix mode.

<Setting before switch off of power>



<Setting at switch on again of power>



IN/OUT OF DIGITAL SIGNALS

For the purpose of mixing digital signal from external digital equipment via the VM88 DIGITAL IN/OUT connector or to output digital signals to external digital equipment, it is necessary to match the objective to the setup.

* When mixing digital signals from external digital equipment

The system clock (INT or EXT) and digital in (format/channel of digital in) must be setup via the setup mode. For details on setup of the system clock and digital in, please refer to "Setup mode" on page 33.

(1) Setup of the system clock

The system clock must be setup for operation (refer to <NOTE> below) of the VM88 using its internal clock (sampling frequency: 44.1kHz) or operation in sync with signal from external digital equipment. The system clock can be setup for INT (Internal) or EXT (External). The initial setting is [EXT].

(2) Setup of digital in

When setting up of digital in, the digital in format and input channel must be set.

* Setup of format

The VM88 input format must be setup to match the digital signal to be input. In addition to formatting to either [S/P DIF], [ADAT 48kHz] or [ADAT 44.1kHz], [OFF] can also be selected (the VM88 is set to [OFF] in the initial state). The sampling frequency (44.1kHz/48kHz) at input of S/P DIF signals is automatically selected by reading the FS status contained in the signal. However, as ADAT digital signals cannot automatically acknowledge the sampling frequency, it must be set to either [ADAT 48kHz] or [ADAT 44.1kHz] in match with the input signal sampling frequency.

* Setup of the input channel

To which channel of the VM88 should the external digital input (S/P DIF or ADAT) be assigned, must be setup. For the channels to be assigned, either 2 channels from among CH 1/2, CH3/4 CH 5/6 or CH 7/8, 4 channels from CH 1 ~ 4 and CH 5 ~ 8 or ALL CH for 8 channels, must be setup. In the initial state, the digital in format is set to ALL CH for ADAT 48/44.1 and 7/8 for S/P DIF. Should the lock of the digital input signal become disengaged, the channel set for digital input is automatically switched to analog input. Therefore, in a situation where you cannot redo, such as during a live session, if both analog and digital inputs are simultaneously applied to the VM88, even though the digital signal is interrupted, it will automatically switch to analog and thus a lost opportunity for recording can be avoided.

< NOTES >

- * If the VM88 is used as a slave with the system clock set to [INT], noise will occur. Therefore, if the system clock must be set to [INT], the VM88 must be used as the master machine. For example, when connecting a digital recorder which can function only as a slave machine to the VM88, use the VM88 as the master machine and set its system clock to [INT] for the purpose of synchronizing the digital recorder with the VM88 digital output. Otherwise, use the VM88 as the slave and set the system clock to the initial state setting of [EXT].
- * When selecting channels 5/6 or 7/8 for input channels of digital in, be careful when setting the input modes of channels 5/6 or 7/8 which are in the setup mode. For example, with the input mode of channels 5/6 set to "monaural," even though the digital in channels 5/6 are selected, signals different between channel 5 and 6 will not be input although the same signal input to channel 5 will also be input to channel 6 (The same applies to channels 7/8). For setup of channel 5/6 and 7/8 input modes, refer to "Setup mode" on page 33.

< Please remember! >

At input of S/P DIF signals, the S/P DIF L channels will be assigned to odd number channels and R channels to even number channels. For example, if the digital input channel is set to [CH 1/2] (2 channels), S/P DIF L signal will be assigned to channel 1 and the R signal to channel 2. If it is set to [CH5-8] (4 channels), the L and R signals will be simultaneously assigned, the L signal to channels 5 and 7, and the R signal to channels 6 and 8. When an ADAT signal is input, the ADAT (Ch1 ~ 8) signals will be assigned to their corresponding channel numbers. In other words, ADAT Ch 1 will be assigned to channel 1, Ch 2 to channel 2, and so on. Thus, for example, if set to [CH 1 ~ 4], the ADAT Ch 1 ~ 4 signals only will be input. Analog signals can be simultaneously mixed in channels not setup for digital inputs.

< Please remember the DIGITAL IN status display function >

The DIGITAL IN status indication (DIGITAL, 44.1kHz, 48kHz) in the display will light or blink when the VM88 is in the status shown below.

DIGITAL	44.1kHz	48kHz
---------	---------	-------

- * [44.1kHz] only will light (Initial setup) when the setup mode DIGITAL IN setting is OFF.
- * [DIGITAL] will light when the setup mode DIGITAL IN setting is in other than OFF and DIGITAL IN is correctly locked, and the setup FS ([44.1kHz] or [48kHz]) will be lit.
- * [DIGITAL] will blink and [44.1kHz] will be lit when the setup mode DIGITAL IN setting is in other than OFF and DIGITAL IN is incorrectly locked. In other words, this indicates that the VM88 is operating switched to the internal clock (44.1kHz).

* At output of digital signals to external digital equipment

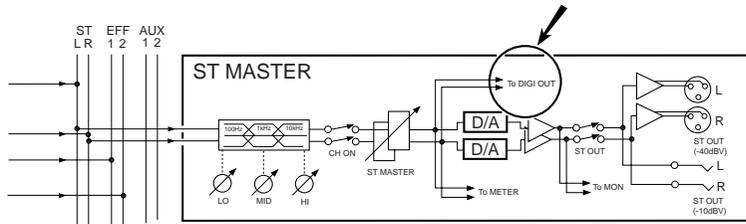
The formatting (S/P DIF or ADAT Dir) of the digital output signal is setup during setup of DIGITAL OUT via the setup mode. It is set to S/P DIF in the initial state.

(1) Setup of digital out

Depending on the format setup for S/P DIF or ADAT Dir, the signal output content from the DIGITAL OUT connector will differ as shown below. To setup of DIGITAL OUT, refer to "Setup mode" on page 33.

* When set to [S/P DIF]:

The same signal output from the ST OUT L, R connectors (The STEREO L, R mixed signal) will be output in digital. The S/P DIF digital signal shown at center of the block diagram below will be output at the DIGITAL OUT connector.

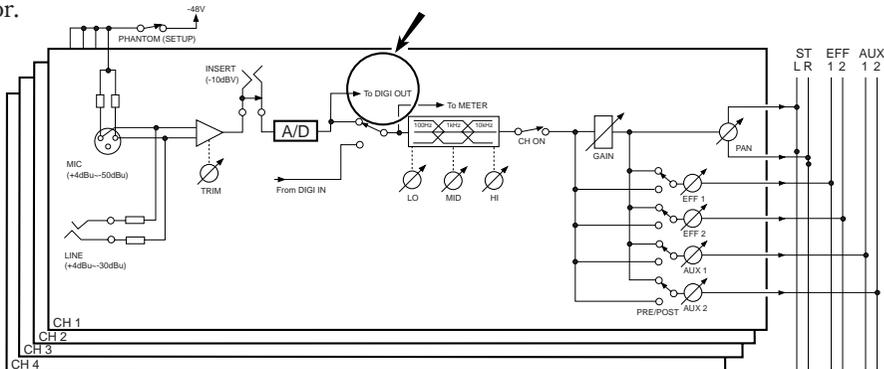


< Please remember! >

If the digital output format is set to [S/P DIF], the digital mix signal will be output from the DIGITAL OUT connector without being affected by the ST OUT ON/OFF switch. However, the signal of a channel whose mute is switched ON will not be output.

* When set to [ADAT Dir]:

Input signals of INPUT 1 ~ 8 that are not affected by the INPUT fader and EQ will be output in digital. ADAT digital signals at the center of the block diagram below, will be output from the DIGITAL OUT connector.



< Please remember! >

If the digital output format is set to [ADAT Dir], the signal will be output from the DIGITAL OUT connector without being affected by the ST OUT ON/OFF switch and channel mute.

Channel Parameter Edit Mode

Twelve items, as shown in list below, can be set by the channel parameter edit mode. Regardless of the VM88's current mode, their respective edit modes can be entered by executing the key operations listed below. To exit from the channel parameter edit mode, press the EXIT key.

Setting Item	Executing Key	Changing the channel	Changing the setup content
Setup of PAN (sound image)	When the PAN/EQ key is repeatedly pressed, the setup item will alternately switch. In the initial state, the channel 1 PAN setup will be displayed.	Channel 1 is selected in the initial state and the channel to be edited is selected by pressing each respective CH ON/CH SEL key. The CH ON/CH SEL key LED (green) of the selected channel will blink.	Setup is changed by utilizing the DATA encoder.
Setup of LO-EQ			
Setup of MID-EQ			
Setup of HI-EQ			
Level setup of EFF SEND 1	When the EFF/AUX key is repeatedly pressed, the setup item will alternately switch. In the initial state, the channel 1 EFF SEND 1 level setup will be displayed.		
Level setup of EFF SEND 2			
Level setup of AUX SEND 1			
Level setup of AUX SEND 2			
PRE/POST setup of EFF SEND 1	If the EFF/AUX key is pressed while pressing on the EXIT key, the setup item will alternately switch.		
PRE/POST setup of EFF SEND 2			
PRE/POST setup of AUX SEND 1	In the initial state, the display will be PRE/POST setup of channel 1 EFF SEND 1.		
PRE/POST setup of AUX SEND 2			

<Useful Information!>

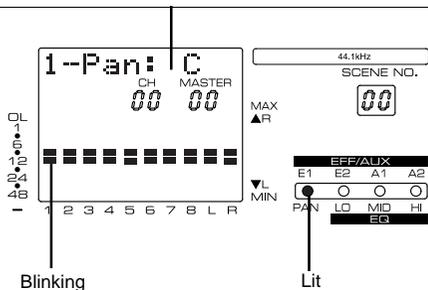
When selecting a desired item, each time the respective key is pressed, it will move to the next item, and if the key is held down, it will change one item backward in the setup item list.

Setup method for PAN setting

Balance of channels 1 ~ 4, 5/6, 7/8 and STEREO MASTER signals must be setup.

1. Press the PAN/EQ key to light up the [PAN] dot in the status display section.
The LCD will display the following:

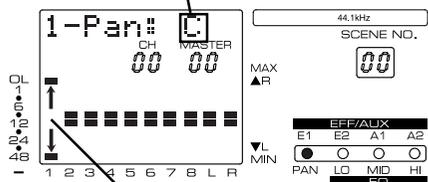
* Character display section:
[1-Pan: C] will be displayed. Now PAN of channel 1 can be setup, and this indicates that the present PAN setting is for centering the sound image (C).



2. Press the desired CH ON/CH SEL key and select the channel to be adjusted.
CH ON/CH SEL key of the selected channel will blink.

3. The number is adjusted with the DATA encoder. The number can be changed within the range of [L10] ~ [C] ~ [R10] and the sound image position will change accordingly. The graphic display will also change at the same time.

[L10] ~ [L1] ~ [C] ~ [R1] ~ [R10] will be displayed.



The digit moves up and down.

<Useful information!>

When the DATA encoder is activated to set PAN, its position will be displayed digitally in 21 steps within the range of [L10] ~ [C] ~ [R10] but the actual change in sound will be continuous (smooth). If channels 5/6 and 7/8 had been selected, balance between the two channels can be setup. If the MASTER had been selected, balance between L and R can be setup.

Setup method for EQ setting

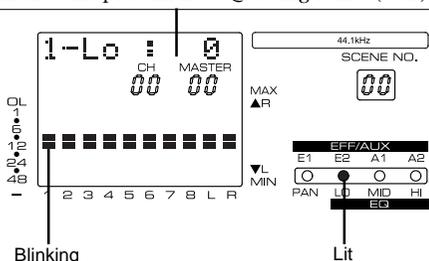
Individual setup of the low region (LO), mid region (MID) and high region (HI) for the signals of channels 1 ~ 4, 5/6, 7/8 and STEREO MASTER.

<Useful information!>

The equalizer specs of VM88 are, 100Hz +/- 18dB (shelving type) for LO-EQ, 1kHz +/- 18dB (peaking type) for MID-EQ, and 10kHz +/- 18dB (shelving type) for HI-EQ. Each can be adjusted in 1dB steps.

1. [LO], [MID] or [HI] dots in the status display section will light by successively pressing the PAN/EQ key.
The LCD display will show the following:

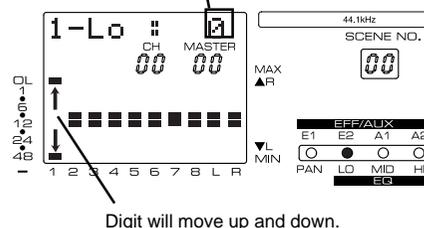
Example: Character display section when [LO] is made to light.
[1-LO: 0] will be displayed. In this condition, LO-EQ of channel 1 can be adjusted and is the indication that the present LO-EQ setting is flat (0dB).



2. The channel you wish to adjust is selected by pressing the desired CH ON/CH SEL key.
The selected channel CH ON/CH SEL key will blink.

3. The number is set with the DATA encoder.
The number will change in the range of [-18dB] ~ [+18dB] and the equalized sound will also change. The graphic display will also change at the same time.

[+18] ~ [+1] ~ [0] ~ [-1] ~ [-18] will be displayed.



Digit will move up and down.

<Useful information!>

When channels 5/6 and 7/8 are selected, the two channels will be simultaneously equalized. If MASTER is selected, both L and R will be equalized at the same time.

Setup method of the EFFECT SEND level

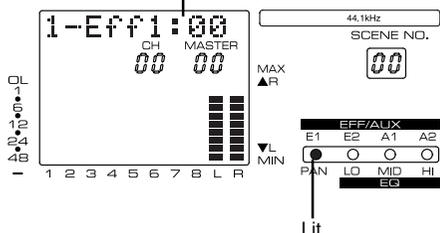
In the following, the effects send level of the signal in the channel to which effects is to be applied is adjusted before sending it to the DSP multi-effects (EFF 1/EFF 2) contained in the VM88. It is also possible for the effect send signal to select either POST (post fader) or PRE (pre-fader). The VM88 is set to POST (post fader) in the initial state.

<Useful information!>

- * The EFFECT SEND signal adjusted in channels 1 ~ 4, 5/6 and 7/8 is sent to the VM88 internal DSP multi-effects (EFF1 or EFF 2). The operating explanation used here is based on the effects type ([Norm. HALL] in EFF 1, [CHORUS] in EFF 2) which are preset in EFF 1/EFF 2. Twenty-eight preset effects for EFF 1 and 38 types for EFF 2 are provided in the VM88. To select other effects or adjust effect parameters, refer to [Effect edit mode] on page 24.
- * Because EFFECT SEND is set in the post fader (the signal controllable by the INPUT fader) in the initial state, in this explanation it is necessary for the INPUT fader to be raised on the channel in which the EFFECT SEND level is to be adjusted. In addition, the MASTER fader to adjust output level from ST OUT L, R is also raised. To setup of the EFFECT SEND PRE/POST, see page 23.

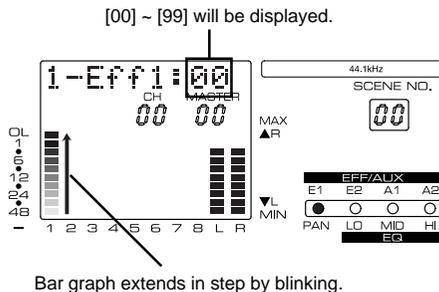
- Status display section [E1] or [E2] dots are lit by pressing the EFF/AUX key. The LCD will display the following:

Example: Character section when [E1] is lit. [1-Eff1:00] is displayed. Channel 1 EFFECT SEND 1 level can now be adjusted. The present EFFECT SEND 1 level setting is "dry" (0).



- Select the channel to be adjusted by pressing the desired CH ON/CH SEL key.

- Adjust the number with the DATA encoder. The number will change in a [0] ~ [99] range and the depth of effects will also change. The graphic display will change at the same time.



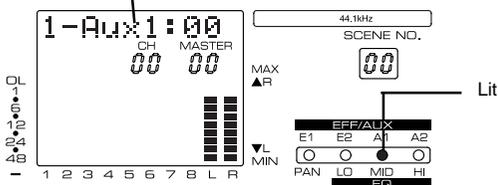
<Useful information!>
If channels 5/6 or 7/8 are selected, the two channels will be set at the same time. If MASTER is selected, the effect send level master can be adjusted and the L, R meter used to indicate the level.

Setup method of the AUX SEND level

Adjusting the signal level output from the VM88 rear panel AUX SEND jack (1/2). The adjusted signal is sent to external equipment (external effects and monitor amplifier) from the AUX SEND jack. The same as with the EFFECT SEND signal, either POST or PRE can be selected for the AUX SEND signal. The VM88 is set to POST in the initial state. To change the setting, please see below [Setup of PRE/POST].

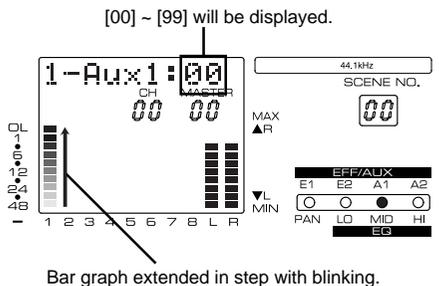
- Light up the [A1] or [A2] dots in the status display section but pressing the EFF/AUX key. The LCD will display the following:

Example: The character display section with light up [A1]. [1-Aux1:00] is displayed. Now, channel 1 AUX SEND 1 level can be adjusted. This also indicates that the present AUX SEND 1 level setting is MIN (00).



- Press the desired CH ON/CH SEL key and select the channel you wish to adjust.

- Adjust the number with the DATA encoder. The number will change in the [0] ~ [99] range and depth of effects will also change. The graphics display will change at the same time.



<Useful information!>
When channels 5/6 or 7/8 are selected, the two channels will be set at the same time. If MASTER is selected, the effect send level master can be adjusted and the L, R meter used to display the level.

PRE/POST setup method for EFFECT SEND/AUX SEND

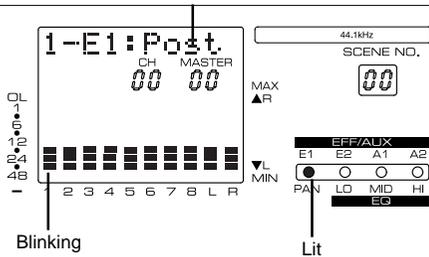
In the procedure here, the effect send and AUX send signals are setup for PRE (pre-fader) or POST (post fader). In the initial state, EFFECT SEND 1, 2, AUX SEND 1, 2 are all setup for POST (post fader).

<Useful information!>

PRE (pre-fader) means that the signal is obtained before the INPUT fader and is not affected by the INPUT fader. POST (post fader) means that the signal is obtained following the INPUT fader and is affected by the INPUT fader. In other words, in the PRE setting, although the INPUT fader is at MIN, the EFFECT SEND or SUX SEND levels can be adjusted but in the POST setting, no signal can be sent if the INPUT fader is at MIN.

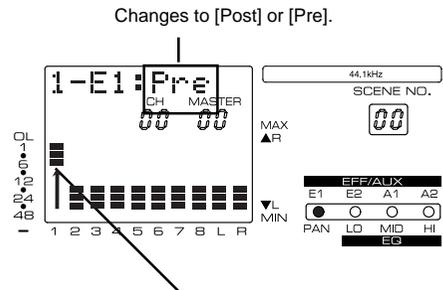
1. While pressing the EXIT key, press the EFF/AUX key to light up [E1], [E2], [A1] or [A2] in the status display section. The LCD will display the following:

Example: The character display section with [E1] is lit. [1-E1:Post] is displayed. Now, channel 1 EFFECT SEND 1 PRE/POST can be setup. This indicates that the present EFFECT SEND 1 PRE/POST is set at POST.



2. Press the desired CH ON/CH SEL key and select the channel you wish to adjust.

3. Adjust the number with the DATA encoder. [Pre] or [Post] can be selected. The graphic display will also change at the same time.



If [Pre] is selected, the blinking 3 digits move upward.

<Useful information!>

When channels 5/6 or 7/8 are selected, the two channels will be set at the same time. If MASTER is selected, all channels will be at the same time.

Effect Edit Mode

The VM88 offers high quality ambient effects by employing the A. S. P. (Fostex Advanced Signal Processing Technology), which is exclusively developed by Fostex. With the A. S. P., you can obtain an incomparably clean and high density Hall Reverb, overwhelmingly clear Room Reverb and wonderfully hi-fidelity Plate Reverb. In addition to these typical Reverbs, the VM88 provides not only various practical algorithms such as Delay, Chorus, Flanger and Pitch Bend, but some combinations of these are also available, e.g., Delay+Reverb.



*** A. S. P. (Fostex Advanced Signal Processing Technology)**

The A. S. P. is an exclusive new digital effect processing technology designed by Fostex. This method extracts maximum efficiency from the limited DSP power. It achieves an overwhelmingly high density Early Reflection sound and wonderfully smooth High Dump response through the H. F. A. (Harmonic Feedback Algorithm). Also, it carries out an elaborate reverb simulation with clear sounds through the H. D. L. P. (Hi-Density Logarithmic Processing), which eliminates the mutual interference between the numerous integrated delay modules and reduce the impurity and girt of the sound.

*** H. F. A. (Harmonic Feedback Algorithm)**

There is one of indispensable elements in the natural echo called "Early Reflection Sound," which is usually sacrificed in commercial reverb products in order to reduce costs. (In practice, the Early Reflection Sound means the very first reverberated sound that bounces back from walls, floors and ceilings of concert halls). The entire reverb sound quality depends on this Early Reflection Sound and how closely it can resemble the real echo. The H. F. A. is an algorithm that enables the effect unit to reproduce a clear and natural Early Reflection Sound by applying an ideal harmonic feedback to each delay module.

*** H. D. L. P. (Hi-Density Logarithmic Processing)**

The reverb sounds consist of lots of small delay elements combined in a complex way, which are produced by many delay modules inside the effect unit. In order to obtain smooth and comfortable reverb sounds, it is very important to efficiently organize the relationship between each delay module and minimize negative mutual interference. The H. D. L. P. is a technology which applies efficient logarithmic processing to each delay module, so that they can work in the most efficient way in order to eliminate harmful reverb elements and roughness. This makes it possible to establish high density and transparent sounds.

Before the partial operation, we will briefly discuss the effect functions here such as Reverb, Delay, Chorus, and Flanger, which are integrated in the VM88.

Reverb

The so called Reverb effect consists of various reflection sounds mixed together. For example, when you clap your hands in a tunnel, you will hear the sound linger even after you stop clapping your hands. This is the Reverb.

The sounds we normally hear in daily life have three types of sounds mixed together, i.e., "Direct sound," "Early Reflection sound" and "Late Reflection sound." The Direct sound means the sound directly reaches the ears from the sound source. The Early Reflection sound means the sound that comes after the Direct sound and has rebound off the wall of the tunnel up to a few times. The Late Reflection sound means that the sound rebounds many times long after the Direct sound has disappeared. Our ears normally hear the "Direct sound" - "Early Reflection sound" - "Late Reflection sound" in the order.

Delay

This is the effect to added a delayed sound to the original sound. You can obtain a richer sound or completely change the original source sound by using the Delay.

Chorus

This makes the one original sound appear to have many sources. The Chorus is used to widen or thicken the original sound.

Flanger

The Flanger is one of applications of the Delay. This is used to create a sound like a jet airplane ascending or descending.

About the effect types

The VM88 contains two independent DSP multi-effect units; EFF 1 and EFF 2.

A variety of effect types are preset for each effect unit. By selecting a suitable effect type, you can process the sound as you wish. You can also edit the parameters of the selected effect type to create your own effect sounds.

The following 28 effect types are preset for EFF 1. The 38 effect types shown on the next page are provided for EFF 2, and these include the same 28 effect types as EFF 1.

Effect types preset for EFF 1

	Name	Parameter type	Explanation
1	Norm HALL	REVERB	Standard hall reverb; detailed and transparent, with a moderate amount of early reflections.
2	Pres HALL	REVERB	Hall reverb with presence and definition.
3	Wet HALL	REVERB	Hall reverb with restrained high-frequency and a refreshing atmosphere.
4	NoER HALL	REVERB	All-purpose hall reverb with no early reflections, and even decay of all frequencies.
5	Lo-F HALL	REVERB	Hall reverb with lingering low-frequency reverberation.
6	STADIUM	REVERB	Stadium reverb characterized by long early reflections.
7	Auditorium	REVERB	Reverb simulating an auditorium with suppressed reverberation.
8	Space HALL	REVERB	Reverb with a long pre-delay, creating the impression of an extended space.
9	Norm ROOM	REVERB	Room reverb simulating a moderate space with some sparkle.
10	Dead ROOM	REVERB	Room reverb simulating a narrow and dead room. Adding a slight amount will give warmth to the sound.
11	Pres ROOM	REVERB	All-purpose room reverb, with good definition and few early reflections.
12	DrumBOOTH	REVERB	Room reverb simulating a drum booth.
13	GARAGE	REVERB	Room reverb simulating a narrow and live space like a garage, with crisp presence.
14	NormPLATE	REVERB	Modern-sounding plate reverb with wide bandwidth.
15	Old PLATE	REVERB	Standard plate reverb with the character of older plate units.
16	PresPLATE	REVERB	Plate reverb with good definition and extended high-frequencies.
17	Wet PLATE	REVERB	Plate reverb with a gentle character.
18	DigiPLATE	REVERB	Plate reverb that emphasizes a digital character, with metallic early reflections.
19	NormVOCAL	REVERB	All-purpose hall reverb with no early reflections, and uniform decay at all frequencies.
20	PresVOCAL	REVERB	Short reverberation with extended high frequency is added to the early reflections of an ideal vocal booth. Since this adds sparkle to the sound, it is effective when you wish to bring the vocal to the forefront.
21	SoloVOCAL	REVERB	Plate-like reverb is added to a spacious short delay. This blends well with any genre of music.
22	Arena VOC	REVERB	Gentle reverb is added to spacious stadium-type early reflections.
23	Arena CHO	REVERB	Short reverb with extended high frequency is added to spacious stadium-type early reflections. Effective on chorus parts.
24	KARAOKE	REVERB	All-purpose reverb (karaoke style) that makes any vocal sound professional.
25	MnDL-HALL	DLY+REVERB	A combined effect of mono delay and hall reverb.
26	MnDL-PLT	DLY+REVERB	A combined effect of mono delay and plate reverb.
27	PnDL-HALL	DLY+REVERB	A combined effect of panning delay and hall reverb.
28	PnDL-PLT	DLY+REVERB	A combined effect of panning delay and plate reverb.

Effect types preset for EFF 2

	Name	Parameter type	Explanation
1 ~ 28	1-28 are the same effect types as the EFF 1 presets listed on the preceding page. (For details refer to the preceding page.)		
29	MonoDELAY	DELAY	Mono delay
30	PanDELAY	DELAY	Panning delay
31	MonoBpmDL	BPM DELAY	Mono delay. Specify BPM and note value to set the delay time.
32	PanBpmDL	BPM DELAY	Panning delay. Specify BPM and note value to set the delay time.
33	Short DL	SHORT DELAY	Short delay that allows you to set the delay time precisely.
34	DOUBLING	DOUBLING	Doubling that allows you to set separate delay times for L and R.
35	CHORUS	CHORUS	Produces a chorus effect. A doubling effect can also be added.
36	FLANGE	FLANGE	Produces a flanging effect.
37	MonoPITCH	MONO PITCH	Pitch shift adjustable in a +/-2 octave range.
38	DlyPITCH	DELAY PITCH	Pitch shift with a feedback delay, allowing strange effects to be produced.

Selecting the effect type

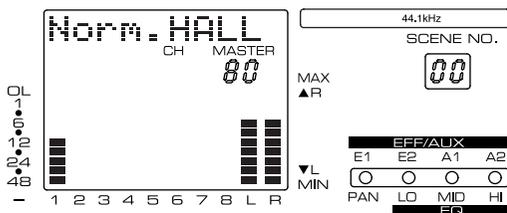
Here's how to select the effect type for EFF 1 or EFF 2.



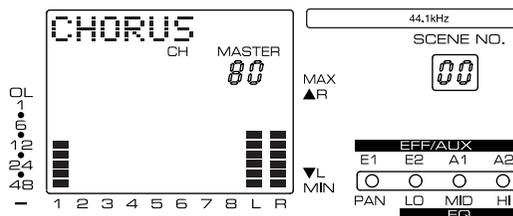
- * As described earlier in "Normal mix mode," raise the INPUT fader of a channel to which a signal is being input and raise the MASTER fader, so that the sound is heard at an appropriate level.
- * As described earlier in "Setting the effect send level," raise the EFF 1 SEND level or the EFF 2 SEND level for the channel(s) to which you wish to apply the effect.

1. If you wish to set EFF 1, press the EFF EDIT mode EFF 1 key. To set EFF 2, press the EFF 2 key.
When the EFF 1 key is pressed:
With the initial settings, the following displays will appear.

When the EFF 1 key is pressed:
With the initial settings, [Norm. HALL] will appear.

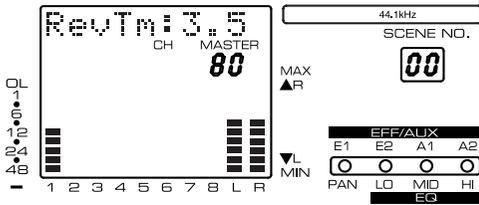


When the EFF 2 key is pressed:
With the initial settings, [CHORUS] will appear.



2. Use the DATA encoder to select the effect type.
The effect types listed in the foregoing tables will appear in succession. When an effect type appears, it will be blinking. The blinking indicates that the effect type has not yet been selected.

- Press the [ENTER] key.
The effect type will be finalized, and the parameter setting screen will appear.
The default (initial) parameter values will be displayed.



Details on the parameters are given in the following section, "Parameter settings."

- To exit Effect Edit mode, press the EXIT key twice in succession.
You will return to Normal Mix mode.

< NOTE >

When you press the ENTER key to finalize the effect type, the sound will be muted for an instant.

Effect parameter settings

Here's how to set the effect parameters.

- If the effect parameter that you wish to adjust is not displayed, press the EFF 1 key (or the EFF 2 key) twice.
One of the parameters of that effect type will appear.
- Press the EFF 1 key (or the EFF 2 key) several times to display the desired parameter.
The parameters that appear will differ, depending on the effect type that is selected.
- Use the DATA encoder to adjust the value.
For details on the meaning and range of each parameter, refer to "Effect parameter details" on the next page.

- If you wish to adjust another parameter, repeat from <step 2>.
- When you are finished making settings, press the EXIT key twice to exit Effect Edit mode.

<Useful Information!>

The parameter display will change as you repeatedly press the EFF 1 (or EFF 2) key. If you hold down the key for a certain length of time, the parameter display will go back to the previous screen.

<Useful Information!>

When the effect parameter being edited is "Delay Time" or "BPM," you can also use the ENTER key or a foot switch to make the setting by tapping, as an alternative to using the DATA encoder. In order to use the foot switch for tap input, you need to make settings in the Setup mode "Foot switch function setting" menu. For details refer to page 33 "Setup mode."

< Note for tap input using the ENTER key / foot switch >

When tap input is used, the value will be finalized on the fourth tap. This means that you must tap four times or more.

Muting an effect

You can mute the effect sound of effect 1 or effect 2.

To mute the effect sound:

Hold down the EXIT key and press the EFF 1 key (or EFF 2 key).
The effect sound of effect 1 (or effect 2) will be muted, and the dry sound will be heard.
When muting is on, the EFF 1 key (or EFF 2 key) LED will blink.

To cancel muting:

Once again hold down the EXIT key and press the EFF 1 key (or EFF 2 key).
The dry sound will change back to the effect sound.
When mute is turned off, the EFF 1 key (or EFF 2 key) LED is off.

<Useful Information!>

Effect muting can also be switched on/off by a foot switch (separately sold) as an alternative to the above procedure.
The foot switch can be used to switch muting on/off for effect 1 or effect 2, or can simultaneously mute both effect 1 and effect 2. For details refer to page 33 "Setup mode."

Effect parameter details

The parameters that can be adjusted will depend on the parameter type.

Reverb effect parameters (parameter type: REVERB)

For effect types 1--24 of the preceding "Effect type" table, the following four parameters can be adjusted.

- | | |
|----------------|--|
| 1. REVERB TIME | Adjust the length of reverberation. Range: 0.1--9.9 seconds (99 steps in 0.1 second units) |
| 2. PRE DELAY | Adjust the time from the original sound until reverberation begins. Range: 0--100 ms (101 steps in 1 ms units) |
| 3. HI RATIO | Adjust the decay ratio of the high frequencies. Range: 0--10 (11 steps in increments of 1) |
| 4. E/R BALANCE | Adjust the volume of the early reflections. Range: 0--99 (100 steps in increments of 1) |

Delay+reverb effect parameters (parameter type: DELAY+REVERB)

For effect types 25--28 of the preceding "Effect type" table, the following four parameters can be adjusted.

- | | |
|----------------|--|
| 1. DELAY TIME | Adjust the delay time: Range: 1--230 ms (230 steps in 1 ms units)
* The ENTER key / foot switch can be used for tap input (refer to page 27). |
| 2. FEEDBACK | Adjust the number of delay repeats. Range: 0--99 (100 steps in increments of 1) |
| 3. DLY BAL | Adjust the delay balance. Range: 0--99 (100 steps in increments of 1) |
| 4. REVERB TIME | Adjust the length of reverberation. Range: 0.1--9.9 seconds (99 steps in 0.1 second units) |

Delay effect parameters (parameter type: DELAY)

For effect types 29 and 30 of the preceding "Effect type" table, the following four parameters can be adjusted.

- | | |
|---------------|---|
| 1. DELAY TIME | Adjust the delay time. Range: 5--680 ms (136 steps in 5 ms units)
* The ENTER key / foot switch can be used for tap input (refer to page 27). |
| 2. FEEDBACK | Adjust the number of delay repeats. Range: 0--99 (100 steps in increments of 1) |
| 3. HI RATIO | Adjust the decay ratio of the high frequencies. Range: 0--10 (11 steps in increments of 1) |
| 4. FILTER | Adjust the tone of the delay sound. Range: L9-L1, -, H1-H9
* [-] is Filter Off
* L1-L9 = LPF (larger numbers will lower the cutoff frequency)
* H1-H9 = HPF (larger numbers will raise the cutoff frequency) |

BPM delay effect parameters (parameter type: BPM DELAY)

For effect types 31 and 32 of the preceding "Effect type" table, the following four parameters can be adjusted.

- | | |
|-------------|---|
| 1. BPM | Adjust the BPM. Range: 30--250 bpm (221 steps in units of 1)
* The ENTER key / foot switch can be used for tap input (refer to page 27). |
| 2. NOTE | Select the note value for the delay. Range: 24, 16, 8T, 16..8, 4T, 8., 4, 2T, 4., 2, 2., 1
* 24 = 16th note sextuplets, 16 = 16th notes, 8T = 8th note triplets, 16. = dotted sixteenth notes, 8 = 8th notes, 4T = quarter note triplets, 8. = dotted eighth notes, 4 = quarter notes, 2T = half-note triplets, 4. = dotted quarter notes, 2 = half notes, 2. = dotted half notes, 1 = whole notes
* The "." shown in the ninth character of the LCD indicates a dotted note.
* The "T" shown in the ninth character of the LCD indicates a triplet. |
| 3. FEEDBACK | Adjust the number of delay repeats. Range: 0--99 (100 steps in increments of 1) |
| 4. FILTER | Adjust the tone of the delay sound. Range: L9-L1, -, H1-H9
* [-] is Filter Off
* L1-L9 = LPF (larger numbers will lower the cutoff frequency)
* H1-H9 = HPF (larger numbers will raise the cutoff frequency) |

Short delay effect parameters (parameter type: SHORT DELAY)

For effect type 33 of the preceding "Effect type" table, the following four parameters can be adjusted.

- | | |
|---------------|---|
| 1. DELAY TIME | Adjust the delay time. Range: 0.1--9.9 ms (99 steps in 0.1 ms units), 10--99 ms (90 steps in 1 ms units), 100--200 ms (51 steps in 2 ms units)
* The ENTER key / foot switch cannot be used for tap input. |
| 2. FEEDBACK | Adjust the number of delay repeats. Range: 0--99 (100 steps in increments of 1) |
| 3. HI RATIO | Adjust the decay ratio of the high frequencies. Range: 0--10 (11 steps in increments of 1) |
| 4. FILTER | Adjust the tone of the delay sound. Range: L9-L1, -, H1-H9
* [-] is Filter Off
* L1-L9 = LPF (larger numbers will lower the cutoff frequency)
* H1-H9 = HPF (larger numbers will raise the cutoff frequency) |

Doubling effect parameters (parameter type: DOUBLING)

For effect type 34 of the preceding "Effect type" table, the following three parameters can be adjusted.

- 1. Lch DELAY TIME Adjust the delay time of the L channel. Range: 0.1--9.9 ms (99 steps in 0.1 ms units), 10--99 ms (90 steps in 1 ms units), 100--200 ms (51 steps in 2 ms units)
* The ENTER key / foot switch cannot be used for tap input.
- 2. Rch DELAY TIME Adjust the delay time of the R channel. Range: 0.1--9.9 ms (99 steps in 0.1 ms units), 10--99ms (90 steps in 1 ms units), 100--200 ms (51 steps in 2 ms units)
* The ENTER key / foot switch cannot be used for tap input.
- 3. FILTER Adjust the tone of the delay sound. Range: L9-L1, -, H1-H9
* [-] is Filter Off
* L1-L9 = LPF (larger numbers will lower the cutoff frequency)
* H1-H9 = HPF (larger numbers will raise the cutoff frequency)

Chorus effect parameters (parameter type: CHORUS)

For effect type 35 of the preceding "Effect type" table, the following four parameters can be adjusted.

- 1. DEPTH Adjust the chorus depth. Range: 0--99 (100 steps in increments of 1)
- 2. DOUBLING TIME Adjust the time difference of the doubling effect. Range: 0--99 (100 steps in increments of 1)
- 3. DOUBLING BALANCE Adjust the volume of the doubling effect. Range: 0--99 (100 steps in increments of 1)
- 4. FILTER Adjust the tone of the delay sound. Range: L9-L1, -, H1-H9
* [-] is Filter Off
* L1-L9 = LPF (larger numbers will lower the cutoff frequency)
* H1-H9 = HPF (larger numbers will raise the cutoff frequency)

Flanger effect parameters (parameter type: FLANGE)

For effect type 36 of the preceding "Effect type" table, the following four parameters can be adjusted.

- 1. RATE Adjust the speed of modulation. Range: 0.1--2.0 Hz (200 steps in 0.01 Hz units)
- 2. DEPTH Adjust the depth of modulation. Range: 0--99 (100 steps in increments of 1)
- 3. MOD DELAY Adjust the modulation delay. Range: 0--200 (201 steps in increments of 1)
- 4. FEEDBACK Adjust the number of modulation repeats. Range: 0--99 (100 steps in increments of 1)

Mono pitch effect parameters (parameter type: MONO PITCH)

For effect type 37 of the preceding "Effect type" table, the following three parameters can be adjusted.

- 1. PITCH Adjust the amount of pitch shift. Range: -24--0--24 (49 steps in semitone units)
* +/-12 is one octave. +/-24 is two octaves.
- 2. ADJUST Make fine adjustments to the amount of pitch shift. Range: -50--0--50 (101 steps in increments of 1)
* +50 is a semitone sharp. -50 is a semitone flat.
- 3. MODE Select the processing method. Range: 1--3 (3 steps)

Delay pitch effect parameters (parameter type: DELAY PITCH)

For effect type 38 of the preceding "Effect type" table, the following four parameters can be adjusted.

- 1. PITCH Adjust the amount of pitch shift. Range: -24--0--24 (49 steps in semitone units)
* +/-12 is one octave. +/-24 is two octaves.
- 2. ADJUST Make fine adjustments to the amount of pitch shift. Range: -50--0--50 (101 steps in increments of 1)
* +50 is a semitone sharp. -50 is a semitone flat.
- 3. DLY TIME Adjust the delay time until the pitch-shifted sound is heard. Range: 0--500 ms (251 steps in increments of 2)
* The ENTER key / foot switch can be used for tap input (refer to page 27).
- 4. FEEDBACK Adjust the number of delay repeats. Range: 0--99 (100 steps in increments of 1)

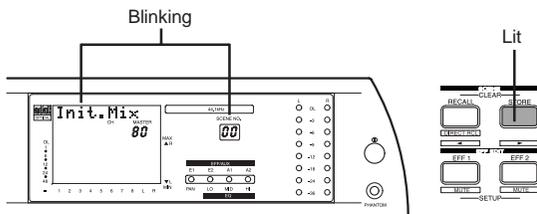
Scene Memory Mode

The VM88 provides 21 scene memories (scene numbers 00--20). Of these, scene number [00] is a preset scene named "Initial Mix," and cannot be modified by the user. Your own settings can be stored in scene numbers [01]--[20]. Each scene stores the contents of Normal Mix mode, Channel Parameter Edit mode, and Effect Edit mode as a set. An eight-character alphanumeric name can be assigned to each scene memory you store.

Storing a scene memory

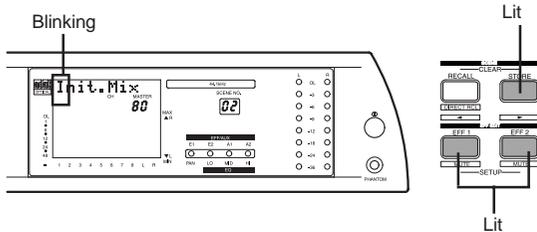
Here's how to store the current mix data as a scene memory.

1. Press the SCENE STORE key.
The number and name of the currently selected scene will blink.



2. Rotate the DATA encoder to select the scene number [01]--[20] into which you wish to store the settings.

3. Press the ENTER key.
The store destination scene number will be finalized, and you will now be able to input the scene name. The current scene name will be displayed.



< NOTE >
If you select scene number [00] and attempt to store, the display will indicate [Read Only], and the operation will be ignored.

4. Use the DATA encoder and cursor keys (EFF 1 key / EFF 2 key) to input the scene name.
A scene name of up to eight characters can be assigned, using the following characters and symbols.

A ~ Z a ~ z 0 ~ 9 + - * / # & ! ? () []
< > : . , <- -> _

5. When you have finished entering the scene name, press the ENTER key.

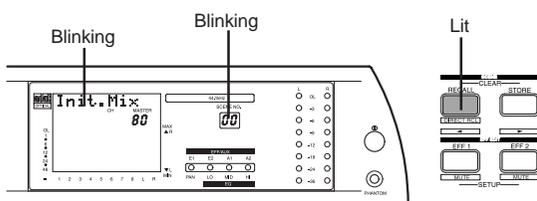
<Useful Information!>
The scene memories you store are preserved even when the power is turned off. However if you reset the VM88 (by pressing the RESET key), all scene memories other than scene number [00] will return to the initial state.

If you decide to halt the process during the scene memory store procedure, press the EXIT key. From any point in the procedure, this will return you to Normal Mix mode.

Recalling a scene memory

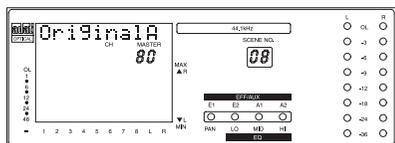
Here's how to recall a previously-stored scene memory.

1. Press the SCENE RECALL key.
The scene number and scene name will blink.



2. Rotate the DATA encoder to select the scene number [00]--[20] that you wish to recall.
As the scene number changes, the corresponding scene name will be displayed.

3. Press the ENTER key.
The scene will be recalled.



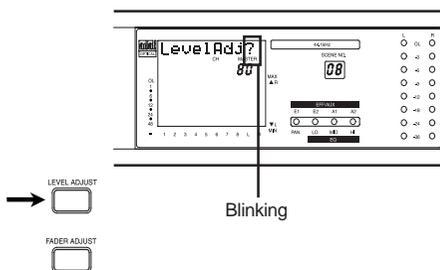
< NOTES >

- * The contents that are recalled will depend on the Setup mode settings "Channel fader recall" and "Master fader recall" described later in this manual. For details refer to "Setup mode" later in this manual.
- * Regardless of the position of the faders when a scene is recalled, the sound will be output at the stored volumes from the instant of the recall. If you are monitoring through headphones, be careful of the sudden loud sounds that may occur when a scene is recalled.

Level adjust

When the physical fader locations and the actual volumes do not match (for example, after a scene memory has been recalled), you can use this function to force the volume levels to the current fader locations.

1. Press the LEVEL ADJUST key.
The display will ask [Level Adj?].



2. Press the ENTER key.
The Level Adjust operation will be executed. This will cause the volumes to change to the current fader locations.

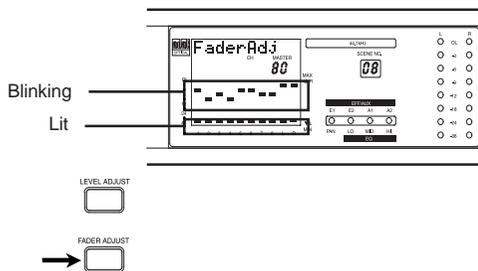
Fader adjust

When the physical fader locations and the actual volumes do not match (for example, after a scene memory has been recalled), you can use this function to manually adjust the fader locations.

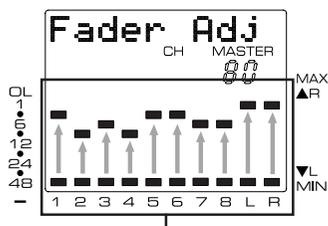
< NOTE >

Fader Adjust will function in Normal Mix mode as well as after a scene is recalled. In Normal Mix mode, the FADER ADJUST key /LEVEL ADJUST key will blink to indicate that the fader locations before the VM88's power is turned off are different than the fader locations when the power was turned on.

1. Press the FADER ADJUST key.
The display will indicate [Fader Adj]. The level section of the display will show dots to indicate the current locations of the faders, and blinking dots to indicate the current actual volume levels.



2. Move each fader so that the lit dots move to the locations of the blinking dots.
Raising or lowering the faders will not affect the actual volume that you are hearing.



Moves each fader so that the lit dots coincide with the blinking dots.

3. Press the EXIT key to exit the Fader Adjust function.

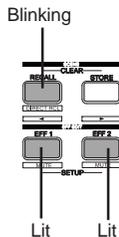
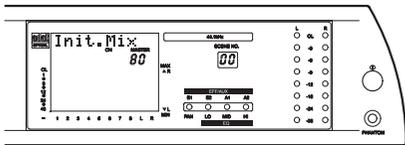
Directly recalling a scene memory

In addition to the method described earlier in "Scene recall," a scene memory can also be recalled directly using the following method of stepping consecutively through the stored scenes.

< NOTE >

Only user scene memories (scene numbers [01]--[20]) can be selected using this method of direct recall. Preset scene number [00] cannot be recalled.

1. Hold down the EXIT key and press the SCENE RECALL key.



2. Press the EFF 1 key or EFF 2 key. Pressing the EFF 2 key will make the scene number change in the forward direction. Pressing the EFF 1 key will make the scene number change in the backward direction.

3. To exit this mode, press the EXIT key. You will exit scene direct recall mode and return to normal mix mode.

<Useful Information!>

Scene direct recall can also be performed using a separately sold foot switch. If you connect an unlatch type foot switch (e.g., model 8051) to the FOOT SW jack, you can use the foot switch to perform the procedure described above. When you press the foot switch, you will enter scene direct recall mode, and pressing the foot switch again will step through the scene numbers. If you hold down the foot switch, you will return to the previous scene number. Here too, you can press the EXIT key to exit scene direct recall mode. In order to use a foot switch to recall scenes, you must make the appropriate setting in "Setup mode" described later in this manual. For details refer to "Setup mode" on the following page.

Clearing a scene memory

Here's how to clear a specific scene memory.

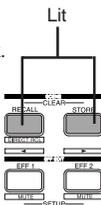
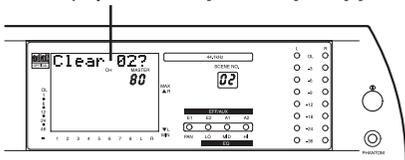
1. Simultaneously hold down the SCENE RECALL key and SCENE STORE key. The number and name of the currently selected scene will be displayed.
2. Rotate the DATA encoder to select the scene number that you wish to clear, and press the ENTER key. The display will ask whether you wish to clear the selected scene number. (The example screen shown here is when you have selected scene number [02].)

3. Press the ENTER key. The scene memory will be cleared.

< NOTE >

If you select scene number [00] and attempt to clear it, the display will indicate [Read Only], and the operation will be ignored. Only scene numbers [01]--[20] can be cleared.

The display will indicate [Clear 02 ?], and [?] will blink.



Setup Mode

In the Setup mode, you can make the following settings to specify how the VM88 will operate.

1. Setup of the SYSTEM CLOCK (Set to INT or EXT).
2. Setup of DIGITAL IN (Setup of DIGITAL IN format/input channel)
3. Setup of DIGITAL OUT (Setup of DIGITAL OUT format)
4. Setup of phantom power ON/OFF
5. Setup of peak hold time (Setup of the level meter peak hold time)
6. Setup of input mode for INPUT 5/6 (Setup to STEREO or MONO inputs)
7. Setup of input mode for INPUT 7/8 (Setup to STEREO or MONO inputs)
8. Setup of ON/OFF for the fader fix mode
9. Setup of ON/OFF for the channel fader recall mode
10. Setup of ON/OFF for the master fader recall mode
11. Setup of the foot switch function (Setup for functioning of the foot switch)
12. Voltage check of the internal battery

Making settings in setup mode

Setting the various setup menus can be carried out in the same manner as shown below. However, the internal battery check menu only is for confirmation of the voltage display.

< Please remember! >

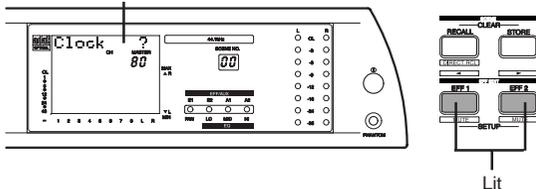
The battery check menu is the only one which simply displays the current internal battery voltage when the ENTER key, in <Step 3>, is pressed and there is no setup item to be selected.

Using the DIGI IN setup menu, two items - DIGI IN format and input channel - can be set. When the ENTER key is pressed (Step-3) after selecting the DIGI IN setup menu, the VM88 will change to the display to select the DIGI IN format. Then, when the ENTER key <Step-5> is pressed, simultaneous with setup of format, the display will change to the next layer input channel select.

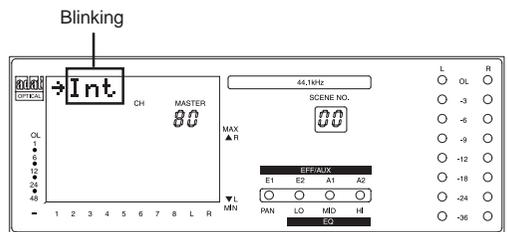
By repeating <Step-3> ~ <Step-5> the DIGI IN input channel can be set. For details on the DIGI IN setup menu, refer to the next page.

1. Simultaneously press the EFFECT EDIT keys EFF 1 and EFF 2.
You will enter Setup mode.

The previously-selected setup menu item will appear.



2. Use the DATA encoder to select the desired setup menu item.
3. Press the ENTER key.
The currently selected item will blink in the display.



4. Use the DATA encoder to select the desired setting.
For details on the available settings, refer to the following page.
5. Press the ENTER key.
The selection will be finalized, and you will return to the display of <step-1>.
6. Press the EXIT key.
You will return to Normal Mix mode.

Details of the setup menu. The (*) symbol in the chart indicates initial setup.

*** System clock setup menu**

During input of a digital signal from external digital equipment, either operate the VM88 with its internal clock (44.1kHz) or operate it in sync with the digital signal from the external digital equipment. The setup content will be held even if the main power is switched off.

<Display>	<Select item>	<Function>
Clock ?	-> INT	The VM88 operates by its internal clock (FS: 44.1kHz).
	-> EXT (*)	The VM88 operates in sync with external digital signals.

< NOTE >
If the system clock is set to [INT], noise will be generated unless the VM88 is used as the master machine.

< Please remember! >
If there is no external digital signal or DIGITAL IN lock is disengaged, the VM88 will operate by [INT] (Internal clock).

*** DIGITAL IN setup menu**

DIGITAL IN format and the DIGITAL IN initiating channel can be set via the DIGITAL IN setup menu. Setup content will be held even if the main power is switched off.

<Display>	<DIGI IN format>
Disi In ?	<Select item>
	<Function>
	-> OFF (*)
	-> ADAT 44.1
	-> ADAT 48.0
	-> S/P DIF

<Select item>	<Function>
->> ALL Ch (*)	Setup to input channels all 8 channels ch1 ~ ch8.
->> ch1/ch2	Setup 2 channels, ch1 and ch2 to input channels.
->> ch3/ch4	Setup 2 channels, ch3 and ch4 to input channels.
->> ch5/ch6	Setup 2 channels, ch5 and ch6 to input channels.
->> ch7/ch8 (*)	Setup 2 channels, ch7 and ch8 to input channels.
->> ch1-ch4	Setup 4 channels, ch1 ~ ch4 to input channels.
->> ch5-ch8	Setup 4 channels, ch5 ~ ch8 to input channels.

(*) The initial setup of the input channel is [ALLCh] when the DIGI IN format is set to ADAT 44.1 or ADAT 48.0, and [ch7/ch8] if setup to S/P DIF.

< Please remember! >
 * If the DIGI IN format is set to S/P DIF, of the input channels to which it is set, S/P DIF L signal is input to the odd number channel and the R signal to the even number channel. In other words, in the initial setup of ch7/ch8, the L signal is routed to channel 7, and the R signal to channel 8. Also, if the input channels are setup to 4 channels, ch1 ~ ch4, then the L signal will be routed to channels 1 and 3, and the R signal to channels 2 and 4.
 * If set to ADAT 44.1 or 48.0, signal will be input to the channel number corresponding to the ADAT signals, ch1 ~ ch8. In other words, at the initial setup of ALL Ch, the ADAT signal ch1 ~ ch8 will be routed to their respective channels. Also, if the input channels are set to 2 channels ch1/ch2, then, the ADAT signal ch1 and ch2 only will be active.

* Setup menu for DIGITAL OUT

Formatting of the digital signal output from the VM88 DIGITAL OUT connectors can be setup. The setup content will be held even if the main power is switched off.

<Display>

Disi Out?

<Select item>	<Function>
-> S/P DIF (*)	The signal same as the mixed signal output from STEREO OUT L, R will be output in digital (S/P DIF).
-> ADAT_Dir	Input signals at INPUT 1 ~ 8 will be directly output in digital (ADAT) without any affect from the INPUT fader and EQ.

* Setup menu for ON/OFF of phantom power (+48V)

ON/OFF of phantom power provided at INPUT 1 ~ 4 (XLR-3-31) can be setup.

<Display>

Phantom ?

<Select item>	<Function>
-> ON	Phantom power (+48V) is supplied to INPUT 1 ~ 4. Top panel PHANTOM LED will be lit.
-> OFF (*)	Phantom power (+48V) will not be supplied. Top panel PHANTOM LED will be extinguished.

<Please remeber!>

- * The phantom power is set to ON, it will be returned to the initial setting (OFF) by switching ON/OFF the power to the VM88.
- * When the setting is switched ON/OFF, the output signal will be muted for several seconds but this is not a malfunction.

<Please remember the following points when using the phantom power supply!>

Do the following before using the phantom power:

- * When connecting a condenser microphone to MIC INPUT 1-4 (XLR-3-31 type) of the VM88, be sure this microphone requires phantom power (+48V).
- * Switch ON the phantom power after connecting the condenser microphone.
- * Always mute the VM88 output when switching ON-OFF the phantom power and when connecting or disconnecting the microphone cable from the VM88.
- * Always switch OFF the phantom power when connecting a dynamic microphone to MIC INPUT 1-4 (XLR-3-31 type). Otherwise, a malfunction could occur.

Phantom power cannot be used with the following equipment:

- * Unbalanced output microphones.
- * High impedance microphones.
- * In a microphone where there is voltage leak between pin 2/pin 3 and pin 1 of the microphone cable canon connector.
- * Old model ribbon microphones of the ground center tap output type.

* Setup menu for peak hold time

The LED bar graph meter (excluding the LCD display meter) peak hold time can be set. The setup content will be held even if the main power is switched off.

<Display>

Peak Hold?

<Select item>	<Function>
-> OFF	Peak hold will not function.
-> 0.5s	Peak hold time is set to 0.5 seconds.
-> 1.0s (*)	Peak hold time is set to 1.0 seconds.
-> 1.5s	Peak hold time is set to 1.5 seconds.
-> 2.0s	Peak hold time is set to 2.0 seconds.
-> 3.0s	Peak hold time is set to 3.0 seconds.
-> 5.0s	Peak hold time is set to 5.0 seconds.
-> HOLD	Peak will be held continuously.

* Input mode setup menu for Input 5, 6

The input mode of INPUT 5 and 6 can be set. The setup content will be held even if the main power is switched off.

<Display>

Input 5/6?

<Select item>	<Function>
-> STEREO (*)	INPUT 5 and 6 will enter the stereo input mode and thus separate signals can be input to channels 5 and 6. This is convenient for inputting a stereo output.
-> In 5>Mono	INPUT 5/6 will enter the monaural input mode and INPUT 5 only will be effective. The signal to INPUT 5 will be simultaneously input to channels 5 and 6.

* Input mode setup menu for Input 7, 8

Input mode of INPUT 7, 8 can be set. The setup content will be held even if the main power is switched off.

<Display>

Input 7/8?

<Select item>	<Function>
-> STEREO (*)	INPUT 7 and 8 enters the stereo input mode and separate signals can be input to channels 7 and 8. This is convenient at input of stereo outputs.
-> In 7>Mono	INPUT 7/8 will be in the monaural input mode and INPUT 7 only will be effective. The signal input to INPUT 7 will be simultaneously input to channels 7 and 8.

* Setup menu for fader fix

Whether the fader manipulation should be reflected on the sound volume or not can be set. The setup content will be held even if the main power is switched off.

<Display>

FaderFix?

<Select item>	<Function>
-> ON	For all modes, manipulation of the INPUT fader/MASTER fader will have not affect on the sound volume. Any accidental shifting of the fader position by vibration and misoperation can be prevented.
-> OFF (*)	Manipulation of the INPUT fader/MASTER fader will affect the sound volume.

* Setup menu for CHANNEL fader recall

When a scene is recalled, whether or not each channel INPUT fader setting only should be recalled can be set. The setup content will be held even if the main power is switched off.

<Display>

ChFdrRcl?

<Select item>	<Function>
-> ON (*)	When scene is recalled, setup figures of each channel INPUT fader position will be called.
-> OFF	When scene is recalled, setup figures of each channel INPUT fader position will not be called and the fader position immediately prior to recalling the scene will be employed directly.

In all modes including the stored scene, the INPUT faders will function normally regardless to the ON/OFF setting.

* Setup menu for MASTER fader recall

Whether or not the MASTER fader setting only should be recalled when recalling the scene can be set. The setup content will be held even if the main power is switched off.

<Display>

MsFdrRcl?

<Select item>	<Function>
-> ON (*)	When a scene is recalled, the setup figure of the MASTER fader position will be called.
-> OFF	When a scene is recalled, setup figure of the MASTER fader position will not be called and the fader position immediately prior to recalling the scene will be employed directly. This is convenient for live performances where you do not wish to recall only the output level, but would like to set it at the performance site.

In all modes including the stored scene, the MASTER fader will function normally regardless to the ON/OFF setting.

* Setup menu for foot switch function

Functions possible using the foot switch can be set. The setup content will be held even if the main power is switched on/off.

<Display>

Foot Sw ?

<Select item>	<Function>
-> SceneU/D (*)	Possible in scene direct recall. (Refer to box below).
-> ST Mute	Possible in mute ON/OFF of the stereo master signal.
-> EFF 1 Mute	Possible in mute ON/OFF of effect 1.
-> EFF 2 Mute	Possible in mute ON/OFF of effect 2.
-> E1 & E2 Mute	Possible in mute ON/OFF of effect 1 and 2.
-> Delay Tap	Possible in tap input of both Delay Time and BPM during effect parameter editing.

< Please remember! >

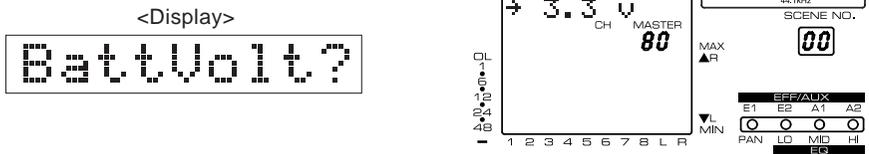
When set to [Scene U/D], the VM88 enters the scene direct recall mode when the foot switch is stepped on once, then with each press of the foot switch, the scene number changes in the forward direction. If the foot switch is pressed continuously, it will return one scene number in the reverse direction. The EXIT key is pressed to exit from the scene direct recall mode.

< NOTE >

There are some effect parameters in which tap input by the foot switch cannot be done. For details on this, please refer to "Details on effect parameters" on page 28.

*** Battery check menu**

This lets you check the voltage of the internal battery. After selecting this menu item, press the ENTER key. The voltage of the internal battery will be displayed, allowing you to check it. When you have checked the voltage, press the EXIT key to exit Setup mode.



The life of the internal battery is approximately two years. When the battery runs down and the voltage decreases to a certain level, a warning message of [Batt Empty] will appear in the display when the VM88 is powered-on.

<CAUTION>

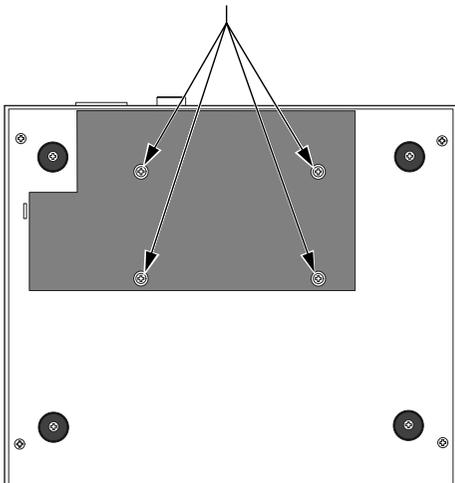
It is not possible for the user to replace the internal battery. Please contact a nearest Fostex Service Station. For details on the [Batt Empty] message, refer to page 8 "Before Operation."

The Options

Multi-purpose clammer can be installed on bottom of VM88. By using the clammer, the VM88 can be mounted on a pipe mic stand.

To install the clammer, use the four screws provided on the bottom of the VM88, as indicated by arrows in schematic below. <NOTE!> Do not use the screws included with the clammer as the screw pitch is different.

Location for installing the clammer.



< NOTE >

Remove the four screws (arrows in left schematic) from the bottom of the VM88 with a screwdriver and using these screws, securely attach the clammer to bottom of the VM88.

For safety's sake when using the clammer, carefully read its operating manual.

(*) Specific clammer:

As of December 1999, the Roland Model APC-33 is the most suitable.

Specifications

0dBu = 0.775Vrms, 0dBV = 1.0Vrms
 XLR connector pin assign=1: GND, 2: HOT, 3: COLD
 TRS jack pin assign=T: HOT, R: COLD, S: GND
 * INSERT connector=T: SEND, R: RETURN, S: GND

<Analog Input 1 - 4>

Connector : XLR-3-31 type (Mics)/Balanced
 : ϕ 6mm TRS phone jack (Lines)
 /Balanced
 Input level : -50dBu ~ -10dBu (Mics)
 : -30dBu ~ +10dBu (Lines)
 Input impedance : 3k Ω or more (Mics)
 : 40k Ω or more (Lines)
 PHANTOM switch : +48V (Mic In only, ON/OFF setting
 by Setup mode)

<Analog Input 5 - 8>

Connector : ϕ 6mm TRS phone jack/Balanced
 Input level : -40dBu ~ +4dBu
 Input impedance : 10k Ω or more

<Insert 1 - 4>

Connector : ϕ 6mm TRS phone jack/Unbalanced
 Input level : -10dBV
 Input impedance : 10k Ω or more
 Output level : -10dBV
 Load impedance : 10k Ω or more

<MON IN L, R>

Connector : ϕ 6mm TRS phone jack/Unbalanced
 Input level : -10dBV
 Input impedance : 10k Ω or more

<DIGITAL IN/OUT (S/P DIF or ADAT)>

Connector : Optical
 Format : IEC 60958 (S/P DIF)
 : ADAT (Alesis Proprietary Multi
 Channel Optical Digital Interface)

<STEREO OUT L, R (Balanced/Unbalanced)>

Connector : XLR-3-32 type/Balanced
 : ϕ 6mm phone jack/Unbalanced
 Output level : +4dBu (Balanced)
 : -10dBV (Unbalanced)
 Load impedance : 10k Ω or more

<AUX SEND 1, 2>

Connector : ϕ 6mm phone jack/Unbalanced
 Output level : -10dBV
 Load impedance : 10k Ω or more

<MON OUT L, R>

Connector : ϕ 6mm phone jack/Unbalanced
 Output level : -10dBV
 Load impedance : 10k Ω or more

<PHONES OUT>

Connector : ϕ 6mm stereo phone jack
 Load impedance : 8 Ω or more
 Output level : 100mW (at 32 Ω load)

<Foot Switch>

Connector : ϕ 6mm TRS phone jack
 Model 8051 foot switch

<Others>

Equalizer
 HI : 10kHz +/-18dB (shelving type)
 MID : 1kHz +/-18dB (peaking type)
 LO : 100Hz +/-18dB (shelving type)
 Frequency response : 20Hz ~ 20kHz (TYPICAL)
 Dynamic range : 90dB (TYPICAL)
 A/D : 20bit 64 times over sampling $\Delta\Sigma$
 D/A : 24bit 128 times over sampling $\Delta\Sigma$
 Sampling frequency : Internal=44.1kHz
 : External input=44.1kHz/48kHz
 (S/P DIF or ADAT)
 Total harmonic distortion : 0.01% (TYPICAL)
 Crosstalk : 60dB or more @1kHz

<General>

Dimensions : 273 (W) x 95(H) x 299(D) mm
 Weight : Approx. 2.9kg
 Power supply : 120VAC 50/60Hz
 : 230VAC 50/60Hz
 Power consumption : 18W

Specifications and appearance are subject to change without notice for product improvement.

"Adat" and the  symbol are trademarks of Alesis Corporation.

Declaration of EC Directive

This equipment is compatible with the EMC Directive (89/336/EEC) - Directive on approximation of member nation's ordinance concerning the electromagnetic compatibility and with the Low Voltage Directive (73/23/EEC) - Directive on approximation of member nation's ordinance concerning electric equipment designed to be used within the specified voltage range.

The Affect of Immunity on This Equipment

The affect of the European specification EN50082-1 (coexistence of electromagnetic waves - common immunity specification) on this equipment are as shown below.

In the electrical fast transient / burst requirements, radiated electromagnetic field requirements and static electricity discharging environment, this could be affected by generation of noise in some cases.

Fostex Distributors List In Europe

* Including non - EU countries. * underlined: contracted distributors (as of April, 1999)

<AUSTRIA>

NAME: A TEC Audio-u. Videogeraete VertriebsgesmbH.
ADD: Im Winkel 5, A-2325 Velm, Austria
TEL: (+43) 2234-74004, FAX: (+43) 2234-74074

<BELGIUM>

NAME: EML Sound Industries NV
ADD: Bijvenestraat 1A, B3500 Hasselt, Belgium
TEL: (+32) 11-232355, FAX: (+32) 11-232172

<DENMARK>

NAME: SC Sound ApS
ADD: Malervej 2, DK-2630 Taastrup, Denmark
TEL: (+45) 4399-8877, FAX: (+45) 4399-8077

<FINLAND>

NAME: Norettron Oy Audio
ADD: P. O. Box 22, FIN-02631 Espoo, Finland
TEL: (+358) 9-5259330, FAX: (+358) 9-52593352

<FRANCE>

NAME: Musikengro
ADD: ZAC de Follieuses, B. P. 609, 01706 Les Echets, France
TEL: (+33) 472 26 27 00, FAX: (+33) 472 26 27 01

<GERMANY>

NAME: Studiosound & Music GmbH
ADD: Industriestrasse 20, D-35041 Marburg, F. R. Germany
TEL: (+49) 6421-92510, FAX: (+49) 6421-925119

<GREECE>

NAME: Bon Studio S. A.
ADD: 6 Zaimi Street, Exarchia, 106.83 Athens, Greece
TEL: (+30) 1-3809605-8, 3302059, FAX: (+30) 1-3845755

<ICELAND>

NAME: I. D. elrf. electronic Ltd.
ADD: Armula 38 108 Reykjavik, Iceland
TEL: (+354) 588 5010, FAX: (+354) 588 5011

<ITALY>

NAME: Recoton Italia Srl.
ADD: V. 1 Maggio, N 18, 40050 Quarto Inferiore, (BO) Italy
TEL: (+39) 051-768576, FAX: (+39) 051-768336

<THE NETHERLANDS>

NAME: IEMKE ROOS AUDIO B.V.
ADD: Kuiperbergweg 20, 1101 AG Amsterdam, The Netherlands
TEL: (+31) 20-697-2121, FAX: (+31) 20-697-4201

<NORWAY>

NAME: Siv. Ing. Benum A/S
ADD: P. O. Box 145 Vinderen, 0319 Oslo 3, Norway
TEL: (+47) 22-139900, FAX: (+47) 22-148259

<PORTUGAL>

NAME: Caius - Tecnologias Audio e Musica, Lda.
ADD: Rua de Santa Catarina, 131 4000 Porto, Portugal
TEL: (+351) 2-2086009/2001394, FAX: (+351) 2-2054760/2087488

<SPAIN>

NAME: Multitracker S. A.
ADD: C/Garcilaso No. 9, Madrid 28010, Spain
TEL: (+34) 91-4470700, 91-4470898, FAX: (+34) 91-5930716

<SWEDEN>

NAME: TTS Professional Television AB
ADD: Kavallerivagen 24, 172 48 Sundbyberg, Sweden
TEL: (+46) 8-59798000, FAX: (+46) 8-59798001

<SWITZERLAND>

NAME: Audio Bauer Pro AG
ADD: Bernerstrasse-Nord 182, CH-8064 Zurich, Switzerland
TEL: (+41) 1-4323230, FAX: (+41) 1-4326558

<UK>

NAME: SCV London
ADD: 3A 6-24 Southgate Road, London N1 3JJ, England, UK
TEL: (+44) 171-923-1892, FAX: (+44) 171-241-3644